AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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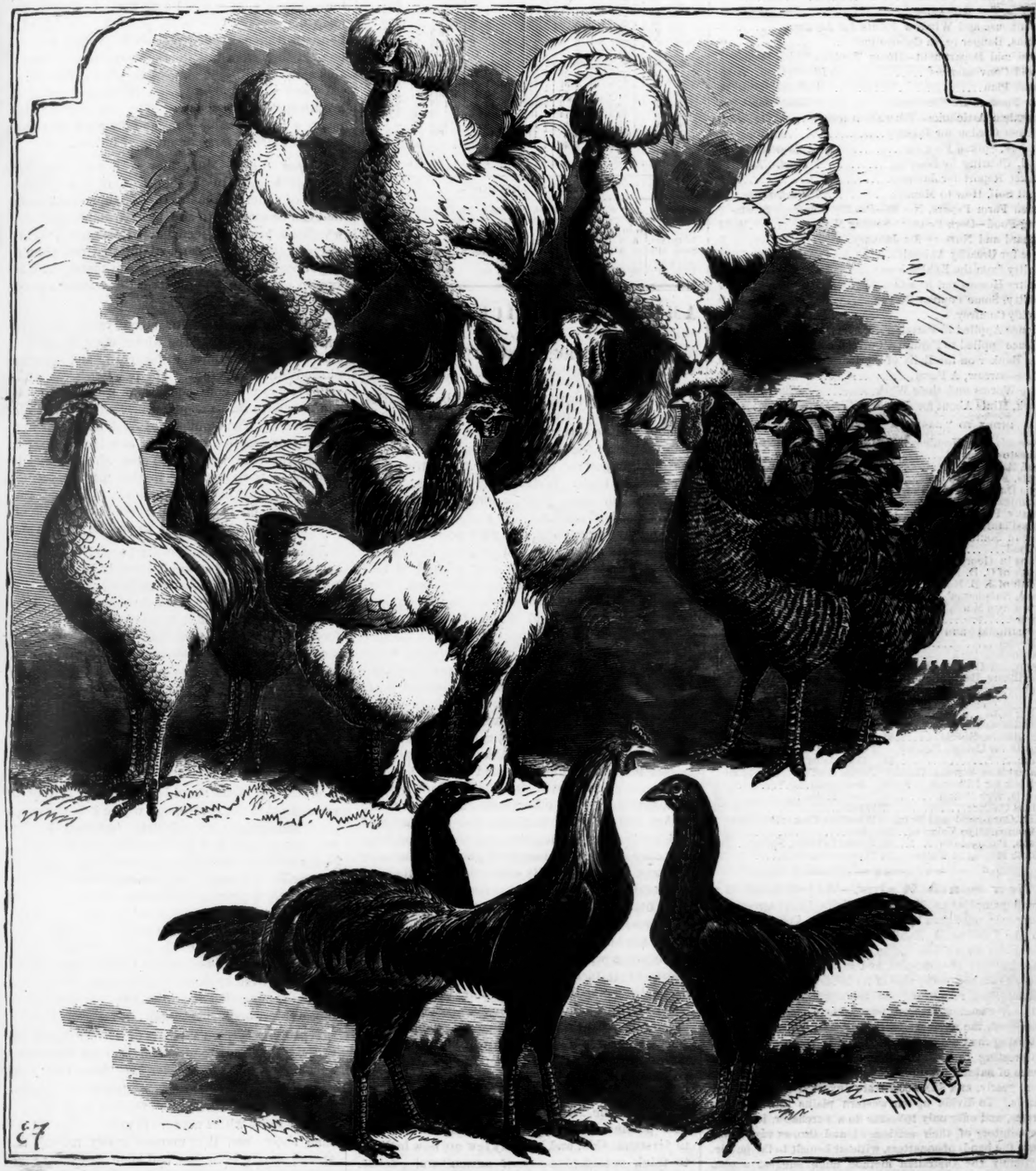

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New South Wales.—We have received a small pamphlet on New South Wales, its progress and resources, published by authority of the Commissioners to the Centennial Exhibition at Philadelphia. The pamphlet gives a description of the country, which is the eastern part of Australia, and of which Sydney is the chief town and port; also of its industries, productions, climate, and resources. As the country has some features in common with our own great pastoral regions in the West, the methods there in use of disposing of and utilizing the immense tracts of public pasture lands, are interesting to us. One hundred and fifty millions of acres of natural pastures are leased at about one cent per acre yearly, and $200,000,000 are invested in flocks and herds. To divide up our western plains into 640 acre tracts, and offer only 160 acres to a purchaser, is simply prohibitory of their settlement, and throws vast tracts into the hands of squatters, without benefit to the public. Possibly the Australian method might suggest a plan for the definite settlement of our vast pastoral regions.

Calendar for January.

Day of Month.	Day of Week.	Boston, New England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Moon rises.	N. York City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Moon rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Moon rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	M	7 30	4 38	6 57	7 25	4 41	7 1	7 19	4 49	7 6
2	T	7 30	4 40	8 18	7 25	4 45	8 21	7 19	4 50	8 24
3	W	7 30	4 40	9 35	7 25	4 45	9 38	7 19	4 51	9 39
4	T	7 30	4 41	10 49	7 25	4 46	10 49	7 19	4 52	10 49
5	F	7 30	4 42	morn	7 25	4 47	morn	7 19	4 52	11 57
6	S	7 30	4 43	0 8	7 25	4 48	0 6	7 19	4 53	morn
7	S	7 30	4 44	1 9	7 25	4 49	1 6	7 19	4 54	1 3
8	M	7 29	4 45	2 18	7 24	4 50	2 14	7 19	4 55	2 10
9	T	7 29	4 46	3 27	7 24	4 51	3 22	7 19	4 56	3 15
10	W	7 29	4 47	4 34	7 24	4 52	4 27	7 19	4 57	4 20
11	T	7 29	4 48	5 35	7 24	4 53	5 28	7 19	4 58	5 21
12	F	7 28	4 49	6 30	7 23	4 54	6 22	7 18	4 59	6 5
13	S	7 28	4 51	7 16	7 23	4 55	7 9	7 18	5 0	7 1
14	S	7 28	4 52	sets	7 23	4 56	sets	7 18	5 1	sets.
15	M	7 27	4 53	5 58	7 22	4 58	6 3	7 17	5 3	6 7
16	T	7 27	4 54	7 1	7 22	4 59	7 4	7 17	5 4	7 8
17	W	7 26	4 55	8 4	7 21	5 0	8 6	7 17	5 5	8 10
18	T	7 26	4 56	9 7	7 21	5 1	9 7	7 16	5 5	9 7
19	F	7 25	4 58	10 9	7 20	5 2	10 8	7 16	5 7	10 8
20	S	7 24	4 59	11 14	7 20	5 3	11 11	7 15	5 8	11 10
21	S	7 24	5 0	morn	7 19	5 4	morn	7 15	5 9	morn
22	M	7 23	5 1	0 21	7 18	5 6	0 18	7 14	5 10	0 15
23	T	7 22	5 3	1 31	7 18	5 7	1 27	7 13	5 11	1 22
24	W	7 21	5 4	2 47	7 17	5 8	2 41	7 13	5 12	2 34
25	T	7 20	5 5	4 2	7 16	5 9	3 53	7 12	5 14	3 48
26	F	7 19	5 7	5 14	7 15	5 11	5 6	7 11	5 15	4 59
27	S	7 19	5 8	6 15	7 15	5 12	6 7	7 11	5 16	6 0
28	S	7 18	5 9	rises	7 14	5 13	rises	7 10	5 17	rises
29	M	7 17	5 10	5 46	7 13	5 14	5 50	7 9	5 18	5 54
30	T	7 16	5 12	7 8	7 12	5 16	7 11	7 8	5 19	7 13
31	W	7 15	5 13	8 27	7 10	5 17	8 28	7 7	5 21	8 29

PHASES OF THE MOON.

MOON.	BOSTON.	N. YORK.	WASH'N.	CHA'STON	CHICAGO.
	D. H. M.	H. M.	H. M.	H. M.	H. M.
3d Quart.	6 9 33 mo.	9 21 mo.	9 9 mo	8 57 mo.	8 27 mo.
New M'n	14 8 44 mo.	8 32 mo.	8 20 mo	8 8 mo.	7 38 mo.
1st Quart	22 11 9 mo.	10 57 mo.	10 45 mo	10 33 mo.	10 3 mo.
Full M'n	29 3 55 mo.	3 43 mo.	3 31 mo	3 19 mo.	2 49 mo.

AMERICAN AGRICULTURIST.

NEW YORK, JANUARY, 1877.

The new year opens favorably for the industries of the country. There is a prospect that all kinds of labor will be better remunerated in the future, than they have been for some time past. One of the most important changes for the better, is in our foreign trade. Instead of importing, as we have done for many years, a hundred millions of dollars worth of foreign goods more than could be paid for by our exports, the past year's business has been the other way, and we have sold of our home products considerably over a hundred millions worth more than we have purchased. Fortunately we have a steady market for all our surplus farm products, and many of our manufactured goods, and a fair prospect of firmly holding these markets against all our competitors, while new markets and new articles of export are continually being found. The trade in dressed beef, for instance, which has sprung up within a year past, has become established and promises to grow steadily; this takes only what can be spared, without advancing prices here. An export trade in horses has also commenced, and several hundred have been shipped with profit. For fruit, vegetables, grain, dairy and other farm products, we have secure and growing markets, and manufactured articles from mills, factories, and workshops, have not only supplanted imported goods in our own markets, but are actually competing with them in the countries to which we were formerly customers. With our wonderful resources, the United States promises to become the great granary and factory of the world. If this promise is fulfilled, the greatest benefits will only be through the successful efforts of farmers and artizans to cheapen their products, while they at the same time maintain the excellent quality which has brought them into popularity. To the farmer the great problem to be solved is, how to lessen the cost of his produce, or increase its amount, and so increase both his gains and his comforts. To do this he must not only use industry, but all the aids which science offers him. True scientific farming is nothing more than the best possible practice. Nearly every farmer now understands this, and but very few are now inclined to think contemptuously of agricultural science. The attainment of this desirable end has been greatly helped by the efforts of the *American Agriculturist*, in popularizing scientific knowledge, by showing that this is simply the knowledge of how to do things in the best, cheapest, most effective, and most profitable manner—in short, how to make the most money out of our labor.

Hints about Work.

Seasonable Planting.—While it may seem strange to the Northern farmer, whose fields are bound in ice or covered with snow, to speak of planting, it will be plain enough to his Southern co-worker, who works, or may do so, in his fields the year round. Round potatoes planted this month in the Southern States, will make a first crop in time for a second to be planted in July. The second crop that may now be in the ground, may be left for table use, or kept covered with litter or leaves, to keep out frost. The newly planted crop should be earthed up as they appear above ground, to protect the tops from frosts. Oats sown at the South this month, will ripen almost as soon as fall sown oats, and will be more likely to escape rust and drouth than if sown later. The oat crop may be made a very valuable one, and by good management will yield a large quantity of fodder.

Compost Heaps.—Much may be done in making compost heaps. In the South there is a greater choice of materials than at the North, and anything that can be secured to add bulk to stable manure, whether it be cotton-seed, bone-dust, guano, night-soil, or other readily fermentable matters, should be collected and saved. Where salt-marsh mud, or swamp muck can be procured, these make a good basis for a compost heap.

Spreading Manure.—For some years we have spread manure during the winter upon meadows, clover-sod to be plowed for corn, and ground plowed for spring crops. The practice is economical of labor, and convenient, and we have no reason to believe that the manure loses any valuable constituent. The ammonia of fresh manure is in a nascent or inactive condition, and is not wasted during the cold weather. Those who may find it convenient to use manure in this manner, can do no harm by making the experiment. Dairy farmers can not do better than spread manure upon their meadows and pastures as fast as it is made.

Live Stock.—Regular attention to all live stock is very important. If an animal is only half fed, it is better that it be half fed regularly, as it will suffer less injury than if attended to one day and neglected the next. But it is poor economy to stint food. "The liberal soul shall be made fat." To see one's stock contented, comfortable, and happy, is not only a happiness to a good farmer, but money in his pocket. Regular hours of feeding, regular watering, regular rations, and regular rest, are conducive to comfort. With regularity there is no haste, no waste, nothing is forgotten, and nothing is done twice over. Animals then digest what they eat, and thrive.

Stables and Sheds should be kept dry and clean where frost is not severe, and where it is, the droppings should be removed daily, lest they be frozen into a mass and become difficult to handle. If dry sand or sawdust be scattered over a cleaned stall or shed, beneath the bedding, frozen manure can be taken up without trouble. It is preferable to have the stables so tight and warm that the manure will not freeze in them during the night. An animal can not rest easily upon a bed of frozen dung, nor in a mass of filth. A cold stable may be much improved by lining it with rough boards, and filling the space between the two boardings with rough litter, buckwheat-straw, or leaves.

Feed Racks.—Have a plenty of feed-racks in the yards. They save fodder, and prevent the master animals from driving weaker ones from their feed.

Corn-Fodder or Pea-Straw should be passed through a feed cutter before feeding it to stock in pens or yards where manure is made. The litter is then short, and the manure easily moved and spread, saving both time and labor.

Salt should be given regularly to every animal

except poultry. Pigs should have only a very small quantity; one ounce weekly, to each full-grown one, is sufficient. Horses, oxen, and cows may have one ounce daily, and sheep may be supplied with all they will consume.

Sheep.—A run in a stubble field when the ground is bare, or the snow is only three or four inches deep, will be of advantage to the sheep. Any weakly ones should be turned out by themselves, in a place where they can be looked after. A constant watch should be kept over the flock, lest one should fall into a furrow or drain and be unable to recover itself. Ewes may thus be lost if neglected. Never fail to count the sheep when they go out and come in. Never compel them to jump over bars, but remove the lowest one, lest legs be broken. If a sheep's leg is accidentally broken, bandage it with splints, and keep it by itself for a week or two, until the fracture is repaired, which is easily done, without any dressing or other treatment.

Poultry.—If early eggs are desired, the pullets and young hens should be fed in the mornings with some cracked corn steeped in boiling water until it is only moderately warm. In the afternoons some corn warmed in the oven may be given. Between these meals some mixed feed of potato peelings, house scraps, and wheat screenings boiled together, and seasoned with red pepper, will be useful. A cabbage may be hung in the yard for them to peck at. Provide a clean, warm, but well ventilated house, and nests of clean straw.

Sundry Matters.—Be careful of lights in the barns and stables. Safe lanterns only should be used. We have used the glass globe lanterns, protected with wire, for many years without the least accident, or breaking one of them. Only perfectly safe oil should be used. Devoe's and Pratt's oils may be used with perfect safety anywhere. With these oils if a lamp should fall, there can be no fire if it is picked up again immediately. Choose a perfectly solvent Insurance Company in which to be insured, and take no risks. Keep roofs, roads, and sidewalks clear of snow. Ventilate the cellars whenever the weather is sufficiently mild. A tub of water placed in the cellar on very cold nights, will protect fruit or vegetables from freezing. Clean up all machines and tools and oil them, coat the bright parts with tallow, and cover them to keep out dust and dirt. Prepare for packing ice by and by, or pack it now if possible. A few loads of saw-dust should be hauled when convenient, so that it will be ready when wanted; when the wagon-box is filled, pile on filled bags to complete the load. Keep the shoes of horses and oxen sharpened or roughened, and do not attempt to drive un-shod oxen; it is poor economy to save a set of shoes and lose half of their working power.

Notes on Orchard and Garden Work.

From the questions addressed to us, in cases where we know that an answer would have been found in these columns, we infer that these notes are not read by all for whom they are intended. As formerly headed, "Work in the Horticultural Departments," it is likely that many have hastily passed them by as being "Horticultural," and having no interest for them. On this account we adopt another heading, which is not open to this objection. At the beginning of the year it may be well, for the sake of our many new readers, as well as the older ones, to say a word about the scope and object of these "Notes." Horticulture is, of course, only a branch of Agriculture, and it is often difficult to draw a line between the two. The notes on farm work include all the farm crops, the farm buildings, and domestic animals. We expect that every farmer will have an orchard and kitchen garden; we would have every one own a fruit garden; we hope that every farmer takes sufficient pride in the surroundings of his house to be interested in the notes of the "Flower Garden and Lawn"; and moreover, that he or some of his family will keep a few plants through the winter, whether it be only a pot or two in a window, or a larger number in a conservatory or a small greenhouse. All these are rural matters, they concern all who own and cultivate land, and are regarded as belonging to horticulture. While some of the topics are, or should be, of interest to all farmers, all of them are so to some farmers. The point we wish to impress is this: the notes under these heads are intended *for the same persons* as are those on general farm work, which precede them. Of course all are not equally interested in such matters; the large grain grower, the dairyman, or cattle raiser, cares for fruits and vegetables only so far as his family supplies go, though if his sons or daughters wish to cultivate choice fruits and flowers, he is quite willing, and will often encourage them in it. The majority of farmers have small farms, they hold high priced land, and they must raise high-priced crops. The tendency of farmers in the older States, or anywhere near cities or manufacturing towns, is to convert their small farms into large gardens, and raise fruits and vegetables to supply the near market. Our letters show that as large a number of inquiries are on matters to which the cultivators of large farms scarcely give a thought, as they are concerning farm crops proper. These notes are not in any manner intended for professional gardeners or nurserymen, but solely for farmers, or others who have a garden—small or large—and need such seasonable hints as are suggested by letters of inquiry, or by our own experience. While they must of necessity treat of similar subjects year after year, they are always fresh, and often embody new things, that might form topics for distinct articles; moreover, the answers to various letters are frequently included—though without so stating—in these notes. No one engaged in any branch of agriculture, can afford to do without a book devoted to his pursuits. There were never many sneers about book-gardening; even those who ridicule book-farming—a class that, we are happy to say, is rapidly diminishing—seem to admit that a book on gardening may be useful; "wise in their own conceit" upon farming matters, they are quite willing to accept aid in matters about which they know nothing. A book—if it is one fit to be regarded as a standard—puts the present state of our knowledge upon its subject in a compact form, for easy reference, and no matter how full we may make the paper, it can never supersede the use of books. It is the business of papers to record improvements and progress, and they can not consequently repeat first principles. Hence we say that, in every and all branches of soil cultivation, whether sheep-raising or strawberry growing, a book on the subject will pay for itself many times over—provided it is studied and its teachings heeded. As this is the season for book and brain work, we give under each head the names of the most useful works in each department.

Orchard and Nursery.

An orchard is defined as "An enclosure devoted to fruit trees," and a nursery as "A place for propagating plants—particularly a place for propagating trees or shrubs for transplantation."—As in the popular idea a nursery is almost exclusively regarded as a place where trees and shrubs are *sold*, no doubt that many, seeing the heading "Orchard and Nursery," have supposed that the notes referred to commercial nurseries, and passed them by as of no use to them. We do not presume to teach those who are in the nursery business, but our notes refer to such propagation of trees and shrubs, as may be practised by farmers and others. So with the orchard: one whose chief business is fruit-raising, does not look to his agricultural or horticultural paper for his guide, but in addition to his own experience, he has as aids all the standard works on fruit, looking to the journals for descriptions of new varieties and new methods, and the experience of others in the same occupation. But a dozen trees are as properly an orchard, as are a hundred acres in trees, and the owner of the smaller number is much more likely to need aid, than the regular orchardist. Hence our notes are mainly, though not entirely, intended for the farmer, or the one whose orchard is of moderate extent.

No fruit.—As strange as it may seem, there are many farms, and large ones too, on which there is no orchard. The settler in a wooded country is sure that trees will not grow on newly-cleared land; and the one who has opened his farm on the prairie, can not plant his fruit trees, until he has set a wind-break—and there is always something to prevent that. The years go by, and no trees are planted, and the family go without fruit as a necessary part of their daily food, and only know it as a luxury seldom to be indulged in, on account of the expense. It should need no argument to induce every farmer to have an orchard, large or small, and assuming that those who have no orchard will plant one, that those whose orchard is superannuated will set a new one, and those who have already a small orchard will supplement it with another, we give a few hints as to

Orchard Planting.—No one should plant an orchard, unless he can give the land entirely up to the trees, when they come into bearing. In the older States we hear much about the orchards "running out," the trees cease to be productive, and we are told that the "climate has changed," or that varieties have "degenerated." In all such cases it will be found that it is the land that has "run out," "changed," or "degenerated," and this because the land has been made to bear two crops, one of fruit, and one of something else; it has been "skinned" so beyond endurance, that it yields no fruit, and very poor weeds. Trees planted at ordinary distances, meet at their tops, and the same thing takes place with their roots, which so occupy the soil that there is not only no room for anything else, but they will themselves in time so exhaust the soil that it must be enriched.

Newly planted Orchards should be cultivated, and to secure this, crops may occupy the spaces between the trees, allowing each full possession of as much soil as its size demands, growing only such crops as require manure, and will leave the land in as good condition as when the trees were first set. As the trees increase in size, more space must be given up to them, and the strips in cultivation narrowed. When bearing begins, cropping should cease. Turning an orchard into a grain-field or a meadow, is a sure way to ruin the soil; turning it into a horse or cattle pasture will as surely ruin the trees. The best treatment of an orchard is to keep it in clover, and pasture pigs upon it; this is excellent for both the pigs and the orchard. The occasional plowing required to allow the clover to be renewed, will turn under a most excellent fertilizer, and the land will be kept improving. An incidental advantage to both orchard and pigs will be that the fallen fruit will be eaten, and the increase of insects checked. As to the

Selection of Varieties.—Do not set too many kinds, no matter how highly they are praised by the catalogues or the books. Twelve varieties are a sufficient number for any fruit, whether for home use or market. If of apples, two of these may be of the very early, four for autumn, and six of winter sorts. What these varieties should be, is a matter of the greatest importance. It is impossible to give a list that will suit all over the country. The best guide is local experience, and one about to plant, should take time and pains to learn what varieties have done well in his locality. In a perfectly new country, it will be safest to plant those known to succeed over the widest range.

Where to Buy.—We are frequently asked this question, and our advice is—other things being equal—to deal with the nearest nurseryman. We have often given our opinion of tree-peddlers, and again advise caution. Some good nurseries send out agents or canvassers, and when satisfied that one of these is duly authorized by a responsible nursery to solicit orders, it may be safe to deal with him—but be sure of this first. At any rate it is best to send to one or more nurseries for catalogues, to compare prices. If several can combine and order together from a nursery, it will save freight.

When to Buy.—Send orders before spring opens, that the trees may not get heated or dried out on the road. Should the trees get frozen in transit, put the package in a cool cellar, or cover it outside with a heap of hay or straw, to thaw gradually.

What to Buy.—Planters make a mistake in preferring large trees. Overgrown nursery trees are usually not worth the cost of freight. Recollect that the larger the trees, the more the roots will be injured in taking them up. Many experienced planters prefer to set one-year-old trees, and claim that they come into bearing nearly as soon as those 3 or 4 years old, while having control of them from the beginning, they can shape them to suit.

Buying Nursery Stock.—Those who are not in a hurry, can purchase root-grafts of apples, and pears, and peaches "in the bud," i. e., the stocks were budded last year, have "taken," and will grow the coming season. Root grafts have the cion inserted on the root of a seedling at the "collar," and are offered by many nurserymen. In these forms trees can be bought very cheaply, and as they take but little room, the freight on them is low. If set in nursery rows, but a small percentage will fail. The rows should be wide enough apart to work between them with a cultivator, and the plants one to two feet in the rows, according to the time they are to remain. In this way one can get trees very cheaply, and by purchasing a large surplus, sell to his neighbors young trees, in a year or two, for more than enough to pay for his own.

Varieties.—In order to aid in a selection, we give a list of those varieties of apples, pears, peaches, plums, cherries, and quinces, that succeed over a wide extent of country, but this is not intended to supersede local experience. The varieties of other fruits are given under "Fruit Garden."

Apples.—Early.—Red Astrachan, Early Harvest, Tetofsky, Golden Sweet, Williams' Favorite.... Autumn.—Duchess of Oldenburg, Gravenstein, Jersey Sweet, Porter, Jefferis, Keswick Codlin, Maiden's Blush, Chenango Strawberry.... Winter.—Am. Golden Russet, Ben Davis, Bethlehemite, Fameuse, Johnathan, Lady, Mother, Red Canada, Wine Sap, Bentley's Sweet, Lady's Sweet, R. I. Greening.

Pears.—Early Summer.—Manning's Elizabeth, Doyenne d'Ete, Dearborn's Seedling....Late Summer.—Bartlett, Beurre Giffard, Clapp's Favorite.... Autumn.—Belle Lucrative, Beurre d'Anjou, Beurre Hardy, Doyenne Boussock, Duchesse d'Angouleme, Howell, Seckel, Urbaniste.....Winter.—Dana's Hovey, Lawrence, Vicar of Winkfield. For market the largest number of trees should be Bartlett.

Peaches.—Beatrice, Early York, Early Crawford, Old Mixon Free, George the 4th, Ward's Late Free, and Smock, would give early and late.

Plums.—Unless one will work to keep rid of the curculio, it is of little use to plant the finer kinds. The improved wild sorts give good cooking fruit; the true Wild-goose is regarded as the best of these.

Cherries.—Where the curculio abounds, cherries do poorly. The Early Richmond is generally successful, and excellent as a cooking fruit. Coe's Transparent, Black Tartarian, Belle de Choisy, and Louis Phillipe, are amongst the most reliable.

Quinces.—The Apple, Angers, and Rae's Seedling are all useful and profitable.

Care of Young Orchards.—Keep out all stray animals by strong fences and closed gates....Tramp the snow hard around the trees, to prevent the mice from working....Sprinkle blood on the trunks to keep off rabbits. Trap or shoot rabbits. Where there are but a few trees, they may be protected from mice and rabbits by putting heavy roofing paper, or a shield of laths or corn-stalks, or old roofing tin, around the base of the trunks.

Insects.—Much can be done to prevent the ravages of tent caterpillars, by cutting off the clusters of eggs, which may now be seen glued in a band near the ends of the twigs.

Cions.—Cut them during mild weather, label, and store in sawdust or sand in a cool cellar.

Labels.—Renew all that are defaced, but do not depend upon them; they are convenient, but a permanent record or plan should always be made.

Books on Orchard and Nursery.—As a work comprising all that most farmers would care to know about the propagation and management of fruit trees, with descriptions of select lists of fruits, we especially commend Barry's "Fruit Garden." Another excellent work of a similar scope, is Thomas' "American Fruit Culturist." As a work of reference, containing descriptions of nearly all known varieties, Downing's "Fruits and Fruit Trees of America," is unrivalled. Warder's "Am. Pomology" is on apples; Quinn's "Pear Culture," and Fulton's "Peach Culture," are indispensable to those who engage in these fruits as specialties.

In the Southern States this should be an active month in the orchard; experienced fruit growers regard this as favorable a time to plant trees as later. Old orchards are to be invigorated by a shallow plowing, and where fertilizers, such as compost, or lime, or ashes are needed, apply them now.

The Fruit Garden.

The common method of growing the small fruits in the kitchen garden, is better than not growing them at all, but there are so many reasons why the small fruits should be by themselves, that any one who can possibly do so, should set apart a piece of land for the small fruits. Our remarks on these fruits, given under the head of Fruit Garden, apply to the varieties wherever grown.

Why Have a Fruit Garden?—Primarily as a source of home enjoyment and health, and secondarily as a source of profit. Most of us can recollect when a strawberry patch was a rarity, and cultivated raspberries and blackberries almost unknown, and when even prosperous farmers depended upon the pastures and thickets for the few berries they enjoyed. While the cultivation of small fruits has increased most wonderfully, they are by no means grown by all who might have them, if they would. The most indifferent as to their cultivation, are remarkably appreciative of the fruits themselves. As a matter of profit, they save other food, they save health, and they make the young people more contented. Besides these, there is scarcely a locality in which a surplus of good fruit will not only sell, but sell well. The boys and girls can readily earn enough to supply them with books, and their parents with the *American Agriculturist* and other papers besides, and thus pay in a double sense.

Books.—Barry's, Thomas', and Downing's works, referred to under "Orchard and Nursery," also include the small fruits, and there are works especially devoted to them. Fuller's "Small Fruit Culturist," and Roe's "Manual of Small Fruit Culture," are general works. Fuller's "Grape Culturist," and his "Strawberry Culturist," and others, in the Publishers' book list, are special treatises.

Cranberries do not properly fall under the Orchard or the Fruit Garden, they being a special crop, and profitable only in peculiar localities. White's "Cranberry Culturist," gives the fullest directions, and anticipates every inquiry.

Soil and Manure.—The fruit garden should have a rich and well-drained soil, and the spot should be selected within easy reach of the house, so that an eye can be kept upon trespassers, and the picking be readily done by members of the family. Well decomposed manure only should be used, and abundant materials provided for mulch. In some of the Southern States the soil may be made ready, and much planting may be done this month, but in colder localities this is not praticable until winter is over. It is especially desirable that the soil be of such a character, and drained if need be, that it may be worked very early, as early planting is especially necessary with some fruits. At present we enumerate the leading varieties, to aid in making a selection preparatory to planting.

Barberries are seldom cultivated for their fruit, except by persons from New England, where they often line the roadsides, and are both ornamental and productive of handsome very acid fruit, which makes excellent preserves. There are several species and varieties of barberry, but none superior as a fruit to the common Barberry. It makes a very neat hedge, and may be used to separate the fruit garden from the kitchen or other garden. Readily multiplied by cuttings.

Blackberries need abundant room; 6 feet apart each way at least, and 8 feet is better. The best is Kittatinny. Wilson's Early is early, productive, but not quite so good. Dorchester, one of the best, but not productive. The New Rochelle is large, showy, but very sour unless dead ripe, and is less hardy. The plants are propagated from root-cuttings, and will bear the next year after planting.

Currants.—There are many varieties in the catalogues, though the desirable ones are few. None are superior in flavor to the old Red and White Dutch; if these have rich soil, and are well pruned, the fruit will be larger and finer than it usually is. The Versailles, Red, and White Grape, are larger and best for general culture. Black currants are not popular in this country, though some value them for jam and jelly; the Black Naples is best. Easily grown from cuttings.

Dwarf Trees.—The only large fruits in place in the fruit garden, are those which have been grafted upon some dwarfing stock. Except the pear these trees have little practical value. The pear is dwarfed by budding it upon a quince stock. When so treated, it bears at an early age, and usually produces a good crop, for the size of the tree, of large and exceedingly fine fruit. Some varieties do not succeed on the quince, while with others the fruit is greatly improved. There are but few cases in which we would advise planting dwarf pears for profit, but if one wishes to test many varieties in a small space, the dwarfs allow him to do so, and they are always beautiful and interesting objects. Among those that do so much better on quince that they are often planted for profit, are the Duchesse d'Angouleme, Beurre d'Anjou, Louise Bonne de Jersey, and Howell.....Dwarf apples, grafted on "Paradise" stocks, are charming ornaments; they may be trained as pyramids or bushes, and when well filled with large fruit, are a great curiosity to those unfamiliar with such things. Some of the so-called dwarfs are grafted on "Doucin" stocks, and grow too large for the fruit garden.

Grapes are among the easiest grown and most esteemed among the small fruits; they would be more cultivated than they are, were it not for the popular notion that great skill is required to prune them. By intelligently following a few simple rules, which we give at the proper time, any intelligent person can do all that the vine requires. The grape-vine is one of the most tractable of plants; it may be made to fruit within a foot of the ground, at the top of a fence, or along the second story of a house; the sides of barns and outbuildings may be covered with the foliage and clusters, they may be grown on the simplest trellis, or even on a rude pole. Most of the popular varieties may be grown from cuttings set in the open ground; the plants at the nurseries are very cheap, and there is no reason why every farmer's family, or every family that owns an acre of land, or even a village lot, should not have all the grapes they can eat. We say to every one who owns land, be it much or little, plant one vine, if you can do no more, plant ten if you can, and as many more as you have room for, so that you and your children can daily have your fill during the grape season.

Varieties of Grapes.—As the Bartlett is the most popular and useful among pears, so is the Concord among grapes. There are few localities in which it will not succeed. It is not of the best quality, but whoever has a vine is very sure to have grapes. So we say, if but one kind is to be planted, let it be the Concord. The Wilder, (Rogers' No. 4), and Barry, (Rogers' No. 43), have, with us, all the good qualities of the Concord, and larger and better fruit. The earliest grapes, with us, are the Creveling and Eumelan; not making regular bunches, are unsuited for market. Hartford Prolific, not so good as these, is early, hardy, and abundant. These are black grapes; the very best hardy black grape, we know of, is the Alvey, a poor bunch and poor bearer, but we value it beyond all others. Among red grapes, Catawba and Iona, where they succeed, are among the best. Delaware is very sweet, and generally liked, and Lindley and Agawam, (Rogers' 9 and 15), are the best of Rogers' of this color. White grapes are more sought after than any others, but we have few good ones. The hardiest is Martha, sickishly sweet and unpleasantly foxy; Croton succeeds in some localities; Lady and Elvira are of

promise, but are yet to be generally tested. There are new varieties not yet offered, superior to any yet in cultivation, but have yet to be tested.

Gooseberries.—These are propagated and treated in the same manner as currants. While this is one of the most popular fruits in Europe, the kinds so successful there are well nigh worthless in our hot summers, and we have had to rely on our native seedlings. The grafting as standards, upon the Missouri currant, promises to allow us to enjoy the choicest English kinds; a full account of these was given in September last. Of the natives the Downing is best; the Mountain, Houghton, and Smith's seedlings are all very productive.

Raspberries.—The choicest varieties are tender, and unless they can be laid down and covered with earth for the winter, they should not be planted. Brinckle's Orange, Red Antwerp, and Franconia, belong to this class. The Philadelphia is a poor berry, but gives a large crop, and is quite hardy. The Brandywine, Highland Hardy, and Herstine are among the best hardy sorts. Black-caps are liked by many; of these the Doolittle, and Mammoth Cluster are among the best. The Black-caps are propagated by layering the tips of the shoots; the others multiply by suckers.

Strawberries are so easily managed, and so persistently propagate themselves, there is no reason why every farmer's family should not have the fruit three times a day, during their season, besides a surplus to sell at the nearest village. Any one who can cultivate potatoes can grow strawberries, as there is no plant, the management of which is more simple, as we shall show at the proper time. We now attend to the selection of varieties, having reference to home use and a near market. The Wilson is the popular market berry, but it is not desirable for family use; Chas. Downing is superior to it in every respect, save firmness, which adapts it to shipping. We regard the Charles Downing as the most generally useful berry for home cultivation. Nicanor, Seth Boyden, and Kentucky are other well tested sorts. Monarch of the West, and Star of the West, promise well. In certain localities, with rich, strong soils, President Wilder, Triomphe de Gand, Jucunda, and others are valuable, and each year new varieties are offered, which those who can afford the money and time may test. The plants should be from last year's runners, and not old clumps split up; set as soon as the frost is out, and if well cultivated during the season, they will give a full crop next year.

In the Southern States planting of all kinds may be done, grape vines pruned and trained, and everything put in order for an early start.

Kitchen Garden.

As we have hinted with regard to fruit culture, a farmer may often sell from his Kitchen Garden enough to pay all its expenses, and it is very easy, where there is a demand for fresh vegetables, to extend the kitchen garden into a market garden, the management of the two being nearly the same. Indeed, as before hinted, in all localities near markets, farmers find their profit, if not in market gardening proper, in what we may call farm gardening. In market gardening, a large portion of the products are of a perishable nature, like lettuce, radishes, etc., and must be marketed at once, while farm gardening is devoted to crops in larger demand, and which are more permanent, such as cauliflowers, celery, onions, and the root-crops. Some, near New York, get a larger net profit from a single acre of spinach, than others do from a farm of 30 acres. In localities where there are large express, rail-road, or other stables, carrots are in demand, and we have known a farmer to make from $175 to $300 per acre on these roots. It is only in thickly settled communities, or with easy access to a good market, that these returns are possible, but it is well for every farmer thus located, to find out if there is not some such crop that he may grow with profit.

Books.—Henderson's "Gardening for Profit," Quinn's "Money in the Garden," and Brill's "Farm Gardening and Seed Raising," may all be studied with benefit, each contains something the others do not.

Varieties.—Next month we shall, as usual, enumerate the most profitable varieties and the novelties.

Plants in Cold Frames must be aired whenever the outside temperature will allow.

Preparatory and other work.—Keep the manure pile increasing....Overhaul and repair hot-bed sashes or make new ones....Make a supply of straw mats for early spring use....See that the leaves or litter are not blown away from spinach or other covered crops....Roots and celery in trenches will need more covering as the cold increases.... Repair implements and make markers and all other conveniences likely to be needed....Overhaul the seeds on hand, and throw away all doubtful ones.

At the South.—Put in early potatoes, on light soils; on heavy soils next month is better....Sow at once hardy vegetables, such as peas, radishes, lettuce, spinach, etc., and at intervals for succession ....The root crops, beets, carrots, parsnips and salsify, are sown in the last half of the month.... Prepare hot-beds and sow early cabbages.

Flower Garden and Lawn.

Our notes on other matters are so full that this department must wait until another month for details. The principal thing to be done is to prevent injury to the trees and shrubs. Some thoughtless people, when snow affords sleighing, will drive any where across the grounds, often to the injury of choice shrubs. Have the drive way, if need be, defined by stakes and stretch a fence-wire to keep off such persons....Evergreens are often loaded with snow, which should be shaken off before it becomes hard and icy; if the lower branches are covered in a deep snow, this should be shoveled away, to prevent breaking the limbs as the snow settles after it has frozen to them.

In the Southern States.—Prune roses and flowering shrubs generally....Camellias out of doors, and about to bloom, should be surrounded by a frame, over which a cloth can be thrown in unusually cold weather, to protect the buds.

Greenhouse and Window Plants.

The treatment of plants in windows is not essentially different from that for those in greenhouses, but in the latter case the conditions being more under control, the matter is much easier....Bring bulbs and other plants that have been potted for forcing into the greenhouse, or dwelling room; starting a few at a time for a succession of bloom ....Water only as the plants need it; more plants are killed by keeping the soil soaked and soggy, than by the other extreme....Give air on mild days, but avoid cold drafts....On very cold nights remove house-plants back from the window, and cover with a sheet or newspapers....Cover the plants when the room is swept, occasionally wash smooth leaves with warm water applied by a sponge; shower the plants with rough or downy leaves....Insects are not difficult to keep down if taken as soon as they appear. Smoke in the greenhouse, and tobacco water for window plants, kills lice or "green fly." Frequent showering and washing removes the red spider; mealy bugs can be picked off with a pointed stick, and scale removed by the use of a brush and warm soap suds. ....Sow seed of Sweet Alyssum, Mignonette, and other annuals for blooming later.

Crops in Georgia.—Circular No. 33 issued by the State Department of Agriculture of Georgia, by the Commissioner, Doct. Janes, gives a consolidated report of crops of 1876, with the general averages of yield. Corn is given as yielding 22 per cent more than the crop of 1875, and the breadth planted as 10 per cent greater; a total increase of 34 per cent over last year. The cost per bushel is 43 cents against 58 cents last year. Cotton has yielded 3 per cent less than last year, and its cost of production is about one cent and a quarter per pound less than that of 1875. This reduction is due to the increased home production of provisions and supplies, a result which is to be credited, perhaps entirely, but certainly in great part, to the valuable and successful labors of the Department. No farmer or planter in Georgia, or the neighboring States, can afford to neglect the study of the circulars issued by the Georgia Agricultural Department.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending Dec. 12th, 1876, and for the corresponding month last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 d's *this* m'th	335,000	2,267,800	2,358,500	126,000	560,000	1,050,000
26 d's *last* m'th	331,000	2,196,000	2,815,000	207,000	419,000	1,437,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 d's *this* m'th	381000	2,414,000	2,387,000	97,000	512,000	923,000
26 d's *last* m'th	312,000	2,117,000	2,643,000	141,000	299,000	1,436,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 days 1876..	335,000	2,267,800	2,358,500	126,000	560,000	1,050,000
26 days 1875..	389,000	3,115,000	1,904,000	42,000	207,000	796,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 days 1876..	381,000	2,414,000	2,387,000	97,000	512,000	923,000
26 days 1875..	401,000	3,769,000	1,886,000	74,000	502,000	1,812,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Dec. 11, 1876..	3,110,233	3,285,354	218,841	823,310	1,182,322	512,044
Nov. 8, 1876..	2,048,233	3,206,003	294,361	478,141	1,902,891	495,540
Oct. 9, 1876..	1,981,892	1,195,397	156,305	91,245	825,187	421,751
Aug. 7, 1876..	2,381,299	904,557	94,960	53,914	1,282,895	434,308
Apr. 10, 1876..	3,393,074	232,140	68,429	200,381	706,282	436,942
Jan. 10, 1876..	5,902,293	663,982	100,741	325,191	1,080,800	307,433
Dec. 7, 1875..	5,878,036	816,962	99,908	305,961	1,252,005	258,364
May 11, 1875..	960,804	1,542,924	16,124	16,587	545,209	229,055

4. *Exports from New York, Jan. 1, to Dec. 9.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
1876.	1,779,840	23,188,471	16,038,165	1,209,167	88,097	617,376	654,859
1875.	1,780,299	25,054,693	12,495,349	182,952	1,505	182,754	415,019
1874.	2,055,423	33,700,159	18,328,781	641,661	3,320	110,394	425,553

CURRENT WHOLESALE PRICES.

	Nov. 13.	Dec. 12.
PRICE OF GOLD	109 3-4	107 1-4
FLOUR—Super to Extra State	$4 25 @ 5 75	$5 00 @ 5 90
Super to Extra Southern	4 25 @ 8 25	5 00 @ 8 50
Extra Western	5 15 @ 9 50	5 50 @ 9 75
Extra Genesee	5 75 @ 6 75	5 85 @ 6 85
Superfine Western	4 25 @ 5 00	5 00 @ 5 50
RYE FLOUR	2 50 @ 5 10	3 00 @ 5 20
CORN-MEAL	2 65 @ 3 40	2 70 @ 3 50
BUCKWHEAT FLOUR, ₩ 100 lbs	3 00 @ 3 40	3 25 @ 3 75
WHEAT—All kinds of White	1 25 @ 1 40	1 25 @ 1 50
All kinds of Red and Amber	1 05 @ 1 37	1 00 @ 1 50
CORN—Yellow	59 @ 62	56 @ 61
Mixed	55 @ 60½	55 @ 60
White	58 @ 62	50 @ 59
OATS—Western	30 @ 45	33½@ 45
State	44 @ 51	46 @ 50
RYE	72½@ 92	80 @ 95
BARLEY	75 @ 1 18	68 @ 1 15
BUCKWHEAT	75 @ 85	83 @ 85
BARLEY MALT	75 @ 1 30	75 @ 1 25
HAY—Bale, ₩ 100 lbs	85 @ 90	80 @ 90
STRAW, ₩ 100 lbs	45 @ 90	45 @ 90
COTTON—Middlings, ₩ lb	12¾@ 12¾	12¾@ 12¾
HOPS—Crop of 1876, ₩ lb	24 @ 38	15 @ 38
" old, ₩ lb	4 @ 20	10 @ 20
FEATHERS—Live Geese, ₩ lb	50 @ 57½	45 @ 58
SEED—Clover, ₩ lb	15 @ 15¾	15¾@ 16
Timothy, ₩ bushel	1 95 @ 2 00	1 90 @ 1 95
Flax, ₩ bushel	1 55 @ 1 60	1 60 @ 1 65
SUGAR—Refi'g & Grocery ₩ lb	8¼@ 10¾	8¾@ 11¾
MOLASSES, Cuba, ₩ gal. 50 test	35 @ 36	38 @ 40
New Orleans, new crop, ₩ gal	55 @ 65	50 @ 60
COFFEE—Rio (Gold)	16¼@ 19¼	16¾@ 20
TOBACCO, Kentucky, &c., ₩ lb	6 @ 18	6 @ 18
Seed Leaf, ₩ lb	4½@ 50	4½@ 50
WOOL—Domestic Fleece, ₩ lb	30 @ 52½	30 @ 50
Domestic, pulled, ₩ lb	25 @ 45	22 @ 40
California, spring clip	15 @ 30	15 @ 28
California fall clip	12 @ 23	12 @ 22
TALLOW, ₩ lb	8¾@ 8¾	8 @ 8¾
OIL-CAKE—₩ ton	38 50 @39 00	37 00 @37 50
PORK—Mess, ₩ barrel	— @17 00	16 75 @16 87½
Prime, ₩ barrel	— @ —	— @14 00
BEEF—Plain mess	8 00 @10 00	10 00 @11 50
LARD, in tcs. & bbls, ₩ 100 lb	10 25 @11 00	10 00 @10 12½
BUTTER—State, ₩ lb	22 @ 38	22 @ 37
Western, poor to fancy, ₩ lb	16 @ 35	16 @ 36
CHEESE	5 @ 13¾	6 @ 15
BEANS—₩ bushel	1 30 @ 2 75	1 50 @ 2 40
PEAS—Canada, in bond, ₩ bu	85 @ 90½	90 @ 93
EGGS—Fresh, ₩ dozen	25 @ 30	28 @ 33
POULTRY—Fowls	10 @ 15	8 @ 11
Turkeys—₩ lb	10 @ 16	9 @ 15
Geese, ₩ pair	1 25 @ 2 00	1 25 @ 2 00
Geese, ₩ lb	10 @ 16	7 @ 13
Ducks, ₩ pair	50 @ 90	50 @ 1 00
Roosters, ₩ lb	8 @ 9	6 @ 8
Chickens, dry pick'd ₩ lb	10 @ 18	9 @ 13
GROUSE, ₩ pair	50 @ 1 00	50 @ 90
PARTRIDGE, ₩ doz	30 @ 75	40 @ 90
DUCKS, Wild, ₩ pair	25 @ 1 50	25 @ 1 50
QUAIL, ₩ dozen	1 50 @ 1 75	1 25 @ 1 50
VENISON, ₩ lb	9 @ 17	8 @ 18
RABBITS, ₩ pair	20 @ 35	30 @ 35
HARES, ₩ pair	40 @ 60	40 @ 60
TURNIPS ₩ bbl	75 @ 90	75 @ —
CABBAGES—₩ 100	3 00 @ 7 00	3 00 @ 7 00
ONIONS—₩ bbl	1 50 @ 2 75	1 00 @ 2 75
POTATOES—₩ bbl	2 00 @ 3 00	2 50 @ 3 37½
SWEET POTATOES—₩ bbl	3 00 @ 3 50	3 00 @ 4 00
CAULIFLOWER, ₩ bbl	— @ —	1 00 @ 2 50
BROOM-CORN	3 @ 8	3½@ 8
GREEN PEAS, ₩ bush	1 50 @ 1 55	1 40 @ 1 45
TOMATOES, ₩ bskt	75 @ 1 25	— @ —
CRANBERRIES—₩ bbl	7 50 @10 00	7 00 @ 9 50
" ₩ crate	2 62½@ 3 00	2 75 @ 3 00
APPLES—₩ barrel	50 @ 2 00	75 @ 2 00
SQUASH, ₩ bbl	75 @ 90	1 00 @ 1 25
GRAPES, ₩ lb	6 @ 11	4 @ 11
CIDER, ₩ gal	6 @ 12	7 @ 9

Gold has been up to 109¾, and down to 107, closing Dec. 12, at 107¼, as against 109¾ for Nov. 12; 109 on Oct. 12, and 111¾ on July 12, 1876, and 114¾ on the 18th of Dec., 1875... The month's business has been again seriously impeded in all branches by the political excitement; as also by the variable cable reports as to the political situation abroad, and the course of the foreign

markets. The decline in gold, and extreme firmness in ocean freights, have also worked against activity in produce, on export account....Breadstuffs opened with more animation at advanced prices, with a good demand for shipment, especially for Flour, Wheat, Corn, and Rye,—Corn, in good part for Italian ports, and Rye mainly for Germany. Toward the close, however, the inquiry from all sources fell off materially, and values yielded slightly in the instances of Flour, while Spring Wheat, and most kinds of Barley ruled lower. Red and Amber Winter Wheat was quite firm at the improvement, the latest sales having been at about the highest figures of the month, including prime Amber Missouri, 56,000 bushels, in store, to a local miller, at $1.40; and fancy Amber Indiana, 24,000 bushels, in store, for shipment and milling, at $1.50. Corn ruled comparatively firm, on a fair demand. Rye closed up strong and wanted,—prime State selling at 95c.; good to prime Western at 82@85c. Barley declined materially, under heavier supplies and more urgency to sell, while the demand was moderate. No. 1 Canada closed at $1.12½@$1.15; ordinary two-rowed State sold at 68@70c.; and sundry car lots of Feed stock at 46@50c. About 43,000 bushels California Barley, of late arrival here, have been taken for Cincinnati or Chicago, on private terms. In the Flour line, very liberal transactions were reported early in the month, largely in Minnesota Extras, at buoyant rates; but the final dealings were quite limited....Provisions have been freely dealt in, especially hog products, but at very irregular prices....Cotton has been quite active, but at lower figures. Toward the close, more extensive purchases were reported for shipment, chiefly to Liverpool....Wool has been in less demand, and somewhat less buoyant as to values. The inquiry from manufacturers has been comparatively very moderate....Hops have been in less request, and at the close quoted easier....Seeds have been in fair demand, closing firmly....Hay and Straw moderately sought after at steady rates....Tobacco has been fairly active, and essentially unaltered as to prices....Naval Stores, more inquired for and dearer....Petroleum has been unusually brisk, mainly on export account, and has advanced sharply,—crude in bulk closing here at 15½c.; in bbls. at 18½c.; refined, in bbls., for December delivery, at 32@32½c.; and ditto, in cases, at 35@37c.—the highest figures reached in a long time... Ocean grain freights have been fairly active, and rates have been quoted higher. Cotton and Petroleum freights also active....Grain rates by steam to Liverpool, closed on the 11th of Dec. at 8*@9d*; to Glasgow at 9½*d*; to London at 9*d*; to Liverpool, by sail, at 8@8½*d*; London, by sail, at 8½@9*d*. per bushel. Provisions by steam to Liverpool, 45*s*.@55*s*. per ton; Cotton at ⅜*d*. ℔ lb. Grain, by sail, for Cork and orders, at 7*s*.@7*s*.3*d*. per quarter.

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*	*Tot'l.*
Nov. 20	11,763	55	1,874	29,277	40,586	83,849
Nov. 27	8,325	123	1,713	21,277	33,946	65,384
Dec. 4	10,402	151	1,338	26,724	32,533	71,168
Dec. 11	9,649	99	1,476	31,732	35,270	78,226
Total for 4 Weeks	40,139	428	6,421	109,304	142,335	298,627
do. *for prev.* 5 *Weeks*	18,674	364	10,262	153,662	146,037	359,999

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	10,034	107	1,605	27,326	35,583
do. do. *last Month*	9,735	73	2,052	30,732	29,407
do. do. *prev's Month*	10,869	48	3,215	26,801	24,422

Beeves.—The market for the past four weeks has been marked chiefly by dullness. An advance of ¼c. ℔ lb in the first week was soon lost, mainly by the unfavorable pressure of thin and poor Texans, and receipts of western dressed beef. Nothing was able to resist the downward tendency. The demand for fine fat oeeves for foreign shipment, of which about 1,000 head were shipped last week, did not help things, and these extra beeves sold for 11½c. per 60 lb to the cwt. Sixty head of fat Christmas cattle were sent alive from Philadelphia. Texans have sold for 2½@3½c. ℔ lb live weight, with bulls at 2½@3c. The market, as we close our report, is dull, prices ranging from 7@7½c. ℔ lb for poor cattle: 8½@9½c. for pretty good, and 10@10½c. for good to choice. A few extra steers of 57 lbs. to the cwt., brought 11c. ℔ lb. While the average was helped by some good stock, the general decline during the last week was fully ¼c. ℔ lb.

The prices for the past four weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
Nov. 20	6¾@10½c.	8 @ 9¾c.	9 c.
Nov. 27	7¼@11 c.	8½@10¼c.	9½c.
Dec. 4	7 @11½c.	7¼@10½c.	9¼c.
Dec. 11	7 @11 c.	8¾@10 c.	9¼c.

Cows.—For poor cows there is very poor sale. A few of this character have sold for $35, while 25 fairly good cows averaged $60. An extra premium cow sold for $125. Many springers are arriving that pass at once into the hands of country dealers....**Calves.**—Dressed veals are plentiful, and live are too numerous for the limited demand. Fat dressed veals sell for 10@11c. ℔ lb, choice have brought 12c. Dressed grassers are dull at 4 @ 6c. Live calves are worth 3½@5c. ℔ lb for grassers and half fat veals; 6@8½ for good, and 8½@9c. for choice ....**Sheep.**—The supply has outrun the demand, and after a dull time through the month, prices are down from ½c. to ½c. ℔ lb. Lambs are now sold with sheep, varying from 5 to 6½c. ℔ lb. Prime sheep in lots, with lambs mixed in, and extra in quality, sell up to 7c. ℔ lb; good sheep at 6@6½c.; fair, 5½c., and poor go off very slowly at 3½@4½c. ℔ lb live weight....**Swine.**—Live hogs sold the last week of our report at 6½c. ℔ average 190 lbs., and 6c. ℔ 240 lbs. Dressed are firm at 7½@7¾c.

Prices of Feed.

Bran, per ton	$18.00@$20.00
Middlings, per ton	19.00@ 21.00
Ground Feed, per ton	15.00@ 21.00
Linseed-oil-cake, western, per ton	44.00@ 47.00
Cotton-seed-cake, per ton	25.50@ 40.00
Chandler's Scraps, per lb	3@ 4

Prices of Fertilizers.

No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ℔ ton	$56.50
do. do. guaranteed, ℔ ton	56.00
do do. rectified, per ton	61.50
Mapes' Nitrogenized Superphosphate, per ton	40.00@ 50.00
" Plain Superphosphate (mineral), per ton	30.00@ 35.00
" Bone Superphosphate, per ton	40.00@ 45.00
" Prepared Fish Guano, per ton	35.00@ 40.00
Quinnipiac Fertilizer Co's. Phosphate, per ton	40.00
" " Dry ground Fish Guano, ton	45.00
" " Pine Island Guano, per ton	45.00
Fish Guano (crude in barrels), per ton	18.00
Bone Black, per ton	27.00@ 28.00
Bone Flour, per ton	40.00@ 45.00
Rawbones Ground (pure), per ton	33.00@ 40.00
Rough Bones, per ton	22.00@ 25.00
German Potash Salts, (25@35 per cent), per ton	25.00@ 30.00
Gypsum, Nova Scotia, ground, per ton	8.00 @ 9.00
" In barrels, per bbl	1.25
Wood Ashes, per bushel	16 c.@18 c.
Nitrate of Potash (95 per cent.), per lb	9 c.@ 9¼c.
Sulphate of Potash (80 per cent) per lb	3½c.@ 4 c.
Chloride of Potass, (muriate of potash, 80p.c.), lb	2¾c.@ 3¼c.
Nitrate of Soda, per lb	4½c.@ 5 c.
Sulphate of Ammonia (25 per cent.), per lb	5 c.@ 5½c.
Dried Blood or Dried Meat per unit of ammonia	$3.00@ $ 4.00

containing a great variety of Items, inc'uding many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

Remember
The Valuable Premiums.

See Page 33, and send to the Publishers for an Illustrated List of Premiums if you have not already received it.

☞ **N.B.—The Postage Law.**—The present postal law **requires pre-payment of postage by the publishers.** Each subscriber must therefore remit, in addition to the regular rates, **ten cents for prepayment of yearly postage by the Publishers, at New York.** Every subscriber, whether coming singly, or in clubs at club rates, will be particular to send to this office postage as above, *with his subscription.* Subscribers in British America will continue to send postage as heretofore, for pre-payment here.

Remitting Money: — Checks on New York City Banks or Bankers are best for large sums: make payable to the order of **Orange Judd Company. Post-Office Money Orders** for $50 or less, are cheap and safe also. When these are not obtainable, **register** letters, affixing stamps for postage and registry; put in the money and seal the letter in the presence of the postmaster, and *take his receipt for it.* Money sent in the above three methods is safe against loss.

Bound Copies of Volume Thirty-five are now ready. Price, $2, at our office; or $2.50 each, if sent by mail. Any of the last twenty volumes (16 to 35) will also be forwarded at same price. Sets of numbers sent to our office will be neatly bound in our regular style, at 75 cents per vol. (50 cents extra, if returned by mail.) Missing numbers supplied at 12 cents each.

CLUBS—Increasing: Advantages: Lower terms are given to clubs of four or more subscribers, partly because it costs less to mail in packages, with only name slips on each paper; and partly to encourage getting up large lists. We do not object to a person's adding names to his club from other post-offices, because such additions usually become centers of other clubs....A Club can at any time be increased by the addition of other names, if these start with the same date as the others....Any one having sent a small club at one price, may raise the club to a large figure, and lower rate for all. Thus: one having sent 4 names at $5.40, may send 6 names more for $7.60, making $13 for the whole 10, including postage. And so for other club rates. . The Terms are: Under four names $1.60 each; four to nine names $1.35 each; ten to nineteen names, $1.30 each; twenty names and upwards, $1.10 each. Postage always pre-paid by the Publishers.....Premium clubs may be gathered at any number of post-offices, if all are sent in by the same person.

It Will Pay to supply yourself, your sons, and your workmen, with good papers and books. $10 to $20, or more, expended in this way, will come back every year. Your sons will be kept from idleness and mischievous company; they will understand and respect their work more; they will gain new ideas and learn to think and reason better; they will learn to make their heads help their hands; they will labor more intelligently and be happier because their minds will be developed, and they will have something to think about while at work. Better sell an acre of land than not to have these mind cultivators. Any *intelligent* man will make more off from 9 acres than the unintelligent one will from 10 acres. Think of this in planning and providing for your sons in the future. Store their growing minds with useful ideas, or the devil will fill the vacancies with very undesirable tenants (ideas). (The premium list on page 33 will afford to many an opportunity to get some books free of expense; and plenty of good books, to be *delivered* by mail or otherwise, will be found in the advertising pages.)

Every German Cultivator and Laborer on the Farm, or in the Garden, OUGHT to have the German edition of the *American Agriculturist.* It contains not only the Engravings, and all the essential reading matter of the American edition, but an additional *Special German Department,* edited by the Hon. Frederick Münch, of Missouri, a skillful and successful cultivator and excellent writer. No other German Agricultural or Horticultural Journal in America has been so long issued; no other one contains so much useful information, or a tithe of its engravings. The Germans are a reading, thinking people, and know how to make good use of what they read. Many Americans supply it to their German laborers and gardeners, and all would find it pay to do so.—Nothing else can compete with it in cheapness of price for the same amount of material, engravings, etc., because the expense of collecting and making these is largely borne by the American edition, and no separate office or machinery is required beyond a couple of German editors and the printers. Its terms are the same as the American edition, singly and in clubs; and clubs can be composed of subscribers for either edition in whole, or in part.—☞ Please call the attention of your German neighbors to this paper. It will do much to help new comers to a knowledge of the system and modes of culture used in this country.

Study the Advertising Columns.—We often take up a daily or weekly newspaper and carefully read all the Advertisements through, and never do this without getting some useful information. One learns what business is being done, and how it is done—what is for sale, and by whom. *Our* business columns are of especial value, because of the care taken to exclude all advertisements from parties not believed to be honest. We mean to advertise for no parties who have not both the ability and intention to do all they promise. In order to please advertisers, we repeat the request that those sending orders, or for circulars, etc., to our patrons, will mention *where* the advertisements were seen. We also like to have advertisers thus get some idea of the large number of intelligent and enterprising people they find among our readers.

A Good Work, it will be, to suggest to a neighbor to supply himself and family with the thousand or more columns of good reading, practical hints and suggestions, useful information, and the 600 to 700 pleasing and instructive *new* engravings that will be given in the *American Agriculturist* during this year. It will do him and his family useful service. Do him and us the favor of suggesting his subscription for the present volume.

The Death of Charles D. Bragdon.—The agricultural press has lost one of its best writers, and one of the most industrious workers, in the death of Mr. Bragdon, which occurred at his father's residence at Port Ontario, N. Y., on the last day of November. His disease was consumption, and his health had been such for some two or three years that he sought relief in a warmer climate, but without avail. Mr. B., when quite young, was a favorite with the late Dr. Kennicott, whose teachings did much to prepare him for his future career. He was at one time engaged upon the "Prairie Farmer," then upon the "Rural New Yorker" at Rochester; he went to Chicago, again, as agricultural editor of the "Chicago Tribune," and while on that paper filled other positions. When the "Rural New Yorker" was removed to N. Y. City, he became its principal editor, and continued in that position until he could no longer discharge its duties. He was a versatile writer and an indefatigable worker; he for many years reported the meetings of the American Pomological Society, and the volumes of its

"Proceedings" remain as a lasting record of his painstaking industry. Personally, Mr. Bragdon was one of the most positive of men; as one writer aptly expresses it, "he did his own thinking." He was one of the most out-spoken of men, and an opponent had never any doubt as to his position: on the other hand he was one of the most devoted of friends, a large circle of whom will miss his genial presence, and when they mourn, what seems his untimely departure, will think with pleasure upon his brilliant talents and his winning ways.

The Death of J. B. Root, of Rockford, Ill.—A circular received about the middle of last month informs us of the death of Mr. Root, after a short illness, but gives neither the date of his death or other particulars. Mr. R. was one of the leading market gardeners and seed-growers of the West, and was the author of a very useful "Garden Manual." He was an occasional contributor on gardening matters to our columns. His writings are of an eminently practical character, and show great fertility of expedient, and we are informed by those who have visited his gardens that they were managed with skill and showed the most careful culture. Such a man is a loss not only to his own State, but to the whole country.

The Uses of Asbestos.—Mr. H. W. Johns, besides using asbestos in his roofing, has recently perfected a paint in which asbestos is largely employed, to protect wood-work of all kinds from ordinary exposure to fire. He also works it into a covering for steam and hot air pipes, which prevent all danger to wood-work from these, and at the same time, by preventing the waste of heat, make a saving in fuel.

Lost Letters.—Who is to Blame?—The Dead Letter Office not long ago made out an estimate that one letter in every 75, is defective in date, or direction, or signature, or sealing. We, in common with others, often receive letters of this class. Letters come with considerable sums of money, entirely *unsealed*—an invitation to anybody to help themselves to the contents. Others contain an order with money, but lacking either name of place or signature, or both. In such cases they must be held until the writer sends a second letter, "blowing up" the Publishers or the P. O. Department. In one such case the writer omitted his residence in the second letter. In those cases, "Who is to blame?"—*Moral.*—ALWAYS date a letter in full, giving *P. O.*, (not merely the town), AND give the *State; sign* it; *seal* it; *direct* it plainly and rightly, and read over the direction.

The Complete American Trapper, or the Tricks of Trapping and Trap Making, by Wm. H. Gibson, N. Y.; James Miller. This adds a handsome volume to the list of works on trapping, a subject always fascinating, as it leads to a life in the woods, and the pleasures, (and sometimes the reverse), of camping out. This work is especially intented for boys, and is illustrated with a profusion of engravings, which, with the excellent style of the work, make it a capital gift for boys, especially those who live in the country. Trapping involves the destruction of life, and so far as that goes, seems cruel, but it is often useful and sometimes necessary, and as boys will set traps at any rate, it is proper that they should know how to do it in the best and most merciful manner. Sent from this office, post-paid for $1.75.

Books on Sheep,—"Dr. Wm. C. P." Hooversville, Md. Randall's "Sheep Husbandry," and "Fine Wool Husbandry," refer chiefly or wholly to the Merino. Mr. Randall devoted his sole attention to this breed, and his books are useful, although not altogether recent. The only book that treats of all the breeds of sheep, kept for mutton or wool in this country, or that might be desirable to keep, is Stewart's "Shepherd's Manual." In this book Lincolns, Leicesters, Cotswolds, Southdowns, Hampshiredowns, Oxforddowns, Dorsets, Welsh sheep, Blackfaced Scotch, Cheviots as well as Merinos, are treated of, as well as several promising cross breeds such as Leicester-merino, Cotswold-merino, Cotswold-southdown, and Beacon-downs, the latter a native American cross. The "Shepherd's Manual" is published by the Orange Judd Company, and sold for $1.50.

Bergen Co., N. J., Poultry Exhibition.—The first annual exhibition of the Bergen Co. (N. J.) Poultry Association was held at Hackensack, Nov. 29 and 30. It was a very creditable affair. Over 1,000 birds were exhibited, and many of the specimens were very fine. The largest exhibitor was Mr. J. J. Berry, of Hackensack, who took first and second premiums for White Cochins, Light Brahmas, Plymouth Rocks, White Leghorns, and White Crested Black Polish. Some very fine Silver-Penciled Hamburgs, exhibited by Thos. W. White, of Ridgewood, took first and second premiums. J. C. and D. Pennington took first premium for some splendid Black Hamburgs. Some very excellent Plymouth Rocks were exhibited by D. Benedict, of Rossville, Staten Island, N. Y. The exhibition was well attended and was a well deserved success.

To be had without Money.—

There will be found upon our Premium List (see page 33) a large number of most useful and valuable articles, all of which are new and of the best manufacture, and any of which can be obtained *without money* and with but little *well directed effort.* Among these are: **Beautiful Silver and Gold-Plated Articles—Magic Bell-Head and Charm Pencils and Gold Pens—Fine Table Cutlery—Pocket Knives—Children's Carriages and Toys—Swings—Clocks—Table Croquet—Pianos—Microscopes—Watches—Guns—Sewing and Washing Machines—Books, etc., etc.**—Read all of page 33, and see how easy you can obtain one or more of these good and desirable articles.

"The Farm-Yard Club of Jotham: An Account of the Families and Farms of that Famous Town," is the title of a work by George B. Loring, and published by Lockwood, Brooks & Co., Boston, Mass. Dr. Loring has long been prominent in agricultural matters in Massachusetts, and being President of the N. E. Agricultural Society, is widely known elsewhere. This work had its origin in a series of articles furnished by Dr. L. to the "Boston Globe," and while it presents a view of New England agriculture, also gives an insight into the social life of the farming community. How far those works, which aim to convey solid instruction under the guise of fiction, succeed in accomplishing their object, we are not prepared to say; if people would not skip all the useful part and pick out only the thread of the story, there would be no doubt as to the value of this method of instruction. The present volume should go far to decide this question, as the narrative is well sustained, the characters are well individualized, and so far as we have examined them, the teachings according to the best practice. To adapt the work as one of reference, and to suit the matter-of-fact people who do not care for the story, there is a separate index to the agricultural topics. The book is abundantly illustrated, and in the way of paper, printing, and binding, most creditable to the publishers. Pp. 603. Sent from this office by mail for $3 50.

Grape Culture.—Hyatt's Hand-book, by T. Hart Hyatt, San Francisco, Cal.: A. L. Bancroft & Co. Pp. 279, Price $2. The climate of the Pacific coast being quite dissimilar to that of the Atlantic side of the continent, allows of the open air culture of those varieties of grapes that here can succeed only under glass; hence a work on the culture of our hardy grapes would be of little use in California, and the need of a "Hand Book," especially adapted to the varieties cultivated in that very different climate. Mr. Hyatt, who has furnished such a work, has been a great traveler, and in his long sojourns abroad made himself familiar with grape culture in foreign countries, before he engaged in the pursuit on the shores of the Pacific. The extent of the grape interest in California is but one among the many wonderful features of that wonderful State. The number of bearing vines in 1876, is estimated at 40,000,000, and the number of gallons of wine at 10,000,000; besides there were 20,000 boxes of raisins produced in the State, showing that the manufacture of grapes into raisins is rapidly increasing. The work bears all through the impress of practical experience, and though especially intended for California, it contains much that will be of interest to grape growers in the States east of the Rocky Mountains.

Knight's American Mechanical Dictionary, by Edward H. Knight. N. Y.: Hurd & Houghton. This work, which is in three large volumes, is a cyclopædia rather than a dictionary. We received some of the earlier parts of the work when its publication was begun by another house, several years ago, and found those so useful that we have often wished that it might be completed, and were especially gratified to receive the final portion from the present publishers. The author, long engaged in the Patent Office, has expended 25 years of labor upon the work, and it is one of the most complete, as it is one of the most useful ever issued from the American press. It describes the tools, machines, implements and appliances used in every art, and gives an account of the processes and also the histories of the arts themselves. Its method of indexing and cross-reference is very complete, and adds greatly to its usefulness; one often misses the information a work contains through not knowing just where to look for it, a difficulty that is avoided here. The work gives very complete lists of technical terms, such as are not to be found in the usual dictionaries. One of the striking features of this dictionary is the profuseness of its illustrations. While the publishers state that there are 7,500 engravings, there are practically at least twice as many, as several forms are often given on the same block. The work is sold in 44 parts, or in three volumes.

Practical Botany, by Dr. A. Kochler, N. Y.: Henry Holt & Co. After a careful examination of this work we are unable to discover why it was written. Our views in regard to such works are, the author should either have something new to tell, or should tell the old story in a better form than had been done before. This work does neither.

Sundry Humbugs.

It is not necessary to set forth to our older readers the objects of this column, as too many of them have received useful warnings, or have been able through its agency to warn others. As the new year always brings its hosts of new readers, a word to them may not be out of place. The "Humbug Column" has long been a marked feature of the *American Agriculturist;* many years ago it began to notice such frauds as needed exposure, in separate items, but the number of these was found to be so large, and so rapidly increasing, that after a while these matters were brought together, and presented in a condensed form under the title given above. Its prime, and we may say,

ITS SOLE OBJECT

is to expose all designs that have for their object the defrauding the community at large, but more especially that portion of it in which the *American Agriculturist* finds the greater share of its readers—the farming, or rural community, as it is against these that a large proportion of these schemes are especially directed. We need not enumerate the many species of the genus Humbug. It appeals to the love of money, to the desire for health, to personal vanity, to the baser passions—in short, to every possible motive which will induce people to part with their money, for which they will receive in return something, which, if not absolutely useless, is positively harmful. Every scheme of this kind that has come to our knowledge, which we have good reason to believe to be detrimental to the intents of our readers and the community at large, has been thoroughly exposed, and held up as something to be avoided. Of course this cannot be done without resistance on the part of those implicated, and the suits that have been commenced against us are numerous. These cases have rarely reached a trial, probably because the lawyers of the complainants, on learning the particulars, have advised their clients not to appear in court. In a few cases that have been prosecuted to the end, we have not only been acquitted, but have received the commendations of both court and jury. We mention this to show how careful we are, while

PROTECTING THE COMMUNITY

from fraud, to be sure that we are right, and to let our new readers see, what our old ones already know, that it is of no use to send us unsubstantiated charges. It is very easy for one who thinks he has been defrauded, to write: "So and so is a fraud. I sent him $5 for such a thing, and have had no reply; show him up in your Humbug Columns,"—but if such correspondents reflect upon the matter, they will see how unjust it would be to hold up a man as a cheat, from one end of the country to the other, upon an unsubstantiated charge like this. Every accusation must be accompanied by abundant evidence, or by such details that will allow us to investigate it, before it can be made public. These columns are not to be used to set forth personal grievances, and unless the exposure of a case will warn others, it is of no use to make it public.....This time it is some one in Michigan, who is after the farmers with

"A NEW CEREAL."

We are told that it is of "South American origin;" that it has been "acclimated" in Michigan since 1872; that it will produce from 75 to 150 bushels to the acre, and that it is called "Pampas or Upland Rice." We add that it was "acclimated" before Michigan was even a Territory, much less a State; it did not originate in South America, and that it is not "Pampas" or any

rice, or anything like rice. It is the same old thing turned up again, which a year or two ago was "Ivory Wheat," and was offered to our grandfathers as "Chocolate Corn," and has as many aliases as a confidence man. If people wish to grow "Durra Corn,"—which this is—we have no objection, as we doubt not it may be made useful, but we do object to putting old and well known things before the public under false names.

LOOK OUT FOR THE BOYS.

Last month we mentioned, though not in these columns, a case, in which the young son of one of our friends had all sorts of vile circulars sent to him; since then we have learned of a similar case much nearer home. The son of a gentleman connected with this office, a boy of some 12 years, seeing something advertised that struck his fancy, sent the required 10 cents, and received the article, which was satisfactory, and well worth the money. Soon after this circulars, and letters began to come to this boy from places, where the father knew that the boy had no friends, and this induced him to examine the matter that came by mail; he found it of the vilest character, not sent once, but frequently, and it keeps on coming. The original advertisement was a trap to get the name, and the address has evidently been passed about to several in the "trade." Parents should be on such terms with their children that these will have no correspondence that is kept secret, and they should, as a matter of safety, see that no matter reaches their children through the mails, which does not pass through their own hands. We can not give the names of the scoundrels who are engaged in this business, but if we are not mistaken, at least one of them, up on the Canada border, will find that he can not use the U. S. Post Offices for his purposes, and should he read this, he will exclaim "that's what's the matter."

MEDICAL MATTERS.

The circulars, pamphlets, and other documents, put forth by quack-doctors of all sorts, are so perfectly absurd to one with any knowledge of medicine, that we can hardly avoid treating them with ridicule. We feel that by showing up the thorough folly of their claims, we can better prevent people from giving them serious attention, than we could by any amount of reasoning. Still, after all, this matter of quack-medicines has its serious side, and there is much about it that is really pathetic, and quite beyond ridicule. An honest physician says to his patient: "Your disease is beyond cure; you may live for months, or even years, but you can not hope for a cure. Medicine can do nothing for you, care and good nursing may do much. For me to continue my visits, would be a needless expense; care, nourishing food, and gentle exercise are all that you need, and these you can get without my aid." An upright physician often does this from the best motives, but we are sure that he almost as often makes a mistake; his visits, even if but twice a week, have been of the greatest importance to the patient; they have been looked to as great events; about the time when the doctor should come, he listens to the sound of every vehicle. When the doctor comes he brings a cheerful face, he listens to the story of every pain and ache, he says that this may be or may not be eaten; tells him some bits of news, such as so and so has received a lot of fine oysters, or that quail are now in season, and that he may have half a one—no more, every other day, and many other things of like import. The physician goes off leaving the patient feeling better, and he thinks for a day or two of what the doctor said, and the next day or two of what he will ask or tell the doctor, so that he is really much better in mind, at least, for the visits. When the doctor says that he shall come no more, the invalid is deprived of this pleasant excitement, and something must be found to supply its place. The patient reads the newspapers. He can, unfortunately, read but few in which his own case is not exactly described, and—of course—a sure cure offered. Then begins a trial of this and that quack medicine—most of them being stimulants of one kind or another, he feels better when he begins with one of them, the effect though soon wears off, and he tries another, which being a stimulant or anodyne in another form, is just the thing—for a while—and so it goes on—until the end. This is enacted over and over again in every town in the country, not by the poor and ignorant, for they cannot afford it, but by

REALLY INTELLIGENT PERSONS.

We received only a few days ago a letter, which in point of penmanship and composition is rarely excelled. We were told in touching terms of a sick friend, who wished to try the enclosed recipe, but first our advice was desired, and would we not reply immediately. We could see the whole at a glance, the last hope was hung upon this stuff. We saw how the mail was watched, and when at last our reply came, we could almost see the hope fade away as it was read. It was with a feeling of sadness that we wrote (the letter enclosed circulars from a Syracuse quack who had stolen the trick of Joseph Inmann) to this effect: "It is the old story: this Syracuse chap, from a 'sense of duty,' gives a recipe in which ingredients are given by names not known in medicine. Also from a sense of duty, knowing that these names are not known in any drug store, he has the stuff put up, which he will sell at a round price," and stated that we could not advise the venture. Such cases occur frequently in our correspondence, and are sometimes brought to our notice in

PERSONAL INTERVIEWS.

Not long since a stout, hearty, honest-looking young man from the country, called on us. His story was, that he had sent about $20 to some quack establishment in this city, having been prompted to do so by his kindly desire to benefit a poor but worthy friend who was on a sick bed, and in reference to whose case the quack circulars that he had received made, as they always do, the most definite promises of cure. The money was sent, sundry bottles of "stuff" were received, but his poor sick friend was his poor sick friend still, and now he was trying in vain to get his money back, or some kind of satisfaction. "Could we help him in any way?"—"Do you see and read the *American Agriculturist?*" we asked. —"I see it, for my mother takes it, and thinks everything of it, but I am sorry to say, I haven't read it as I ought to have done."—"Didn't you know that there was a chapter there every month entitled 'Sundry Humbugs,' designed to protect just such honest, and well-meaning, but too credulous persons as yourself?"—"Well," said he in a regretful, self-accusatory way, "my mother *did* tell me I'd better send to you *American Agriculturist* folks, before letting my money go, but *I thought it was all right.*" As the poor fellow stood there evidently as much grieved at his failure to help his sick friend, as at the loss of his own hard-earned money, it was a pitiable case. But what could we do? Money thus lost is never recovered. Poor fellow, we could only give him a few friendly words, and he went home if a sadder, a wiser man. He "*thought* it was all right," as unfortunately do many, when the promises second their hopes. We can give our friends no better New Year's advice, not only not to believe the pretensions of the numberless "medical" circulars that are cumbering the mails, but to not even read their claims, as they excite hopes that can never be realized, and what is of less consequence, their whole end and aim is money, which, once parted with, can never be regained.

Experimenting with Fertilizers.—The writings of Prof. Ville in Europe, and in this country of several who have claimed great results from fertilizers made by certain formulas, have induced in many of our more intelligent farmers a desire to experiment in the same direction. When told that a given formula must contain so much of ammonia, potash, phosphoric acid, lime, etc., they are at once met by the great expense of these in a pure or separate state, and they are at loss to know how they can buy them in the cheapest and most available forms. To meet this want Mr. C. V. Mapes has prepared circulars giving very full information on these points, showing the cost per pound of the above named constituents in the various forms in which they are to be found in commerce. Thus, potash in one drug may cost the farmer 13c. per pound, while he may buy it in another form at 7c., and so with ammonia and the rest. To further aid experimenters he gives the proportions of each of these constituents in each of the leading farm crops, not in percentage, but reckoned in bushels or tons. Mr. M. also furnishes the formulas given by Prof. Ville, and much other useful information in a compact and popular form.

The Forest and Stream Hand-Book for Riflemen, by Major Geo. C. Starr, N. Y.: J. B. Ford & Co. Rifle-shooting as a recreation, and a useful and interesting one, is increasing with wonderful rapidity. Those about to form clubs will find in this little handbook full directions for organization, for outfit, and for regulating their matches. Directions are given for choosing and using a rifle, a list of the existing rifle-clubs in the country, and much other useful matter, and illustrated with maps and engravings, all in a compact pocket volume of 64 pages, and sold for 50 cents.

Fairmount Park—A Good Appointment.—New Yorkers are at present justly concerned as to the future of Central Park, and pending the quarrels of officials, are deprived not only of many facilities for recreation, but the well keeping of the Park appears to be in danger through the lack of money to pay the laborers. At the same time Philadelphians may congratulate themselves that their beautiful and extensive Fairmount Park is in the control of a harmonious Commission, which is constantly working for the improvement of this grandest of public play-grounds. The design of this park does not demand so much aid from art as that of Central Park, yet there must be more or less done in opening views, planting, etc., and it is desirable that there should be a harmony of design throughout. With a view to this end, the Commissioners have appointed Chas. H. Miller, Esq., as "Consulting Landscape Gardener." Mr. M. is of the firm of Miller & Hayes, Mount Airy Nurseries, Philadelphia, and was the Chief of the Bureau of Horticulture at the Centennial Exhibition. A large number of country seats in the suburbs of Philadelphia, and the telling effects produced with very limited materials on the Centennial grounds, afford abundant testimony as to the fitness of Mr. Miller for the new and responsible position to which he has been chosen, and we congratulate the city of Philadelphia on having here the right man in the right place.

Text-Book on Veterinary Obstetrics.—We have received the third part of this work, to which we have previously referred. This part, which occupies over 60 pages, describes the anomalies of gestation and the accidents of pregnancy. Amongst the latter, abortion is treated of to a considerable length, and in an interesting manner. Breeders and dairymen, who have suffered serious losses of stock from this cause, will be greatly interested in the history of this malady, and the explanation of its causes, its prevention, and the treatment, as given in this part.

The Jerusalem Artichoke—Where is it from?

The "Rural New Yorker," in a useful article upon the agricultural value of the Jerusalem Artichoke (*Helianthus tuberosus*), says that it is "found growing wild in Brazil." This positive statement as to a long doubtful point, induces us to ask our cotemporary by whom was it found? If it has some recent information in the case, it should give it for the benefit of others. Humboldt did not find it "wild" or in cultivation in any part of Brazil or other part of South America, nor did Von Martius, whose "Flora of Brazil" is one of the most elaborate of botanical works, meet with it; in fact, up to the present time, there is—unless our friends of the "Rural" have it—no evidence whatever that it was brought from Brazil, or was even ever seen there. That its Brazilian origin is given in various works is true, for it is very common for an error to be copied by one after another, but it is not stated by authors who, in recent years, have investigated the matter. It is given by Parkinson (1640) under the general head of Potatoes, and is figured as *Batatas de Canada*. Linnæus first mentions the plant in "Hortus Cliffortianus" (1737), and accredits it to Canada, though in his later works he, for some reason, changed it to Brazil. In those days geographical boundaries were very indefinite, and Canada was apparently nearly all of the present United States, not included in Virginia. There is not only no evidence that the plant was brought from Brazil, or that it now exists there, but there is no *Helianthus*, or Sunflower, nearly related to it found there, they being all natives of Mexico and the United States. It is true that this is negative testimony, but it is strengthened by the fact that the Jerusalem Artichoke is quite hardy, even in New England, which tells against its Brazilian origin, and would, were it from that country, stand alone as a tropical plant hardy enough to endure our severest winters. As we have shown that the probabilities are strongly against the accuracy of the "Rural's" statement that the plant "is found growing wild in Brazil," it will no doubt, and properly, ask where it did originate. Here also we can only give the probabilities. There is one of our wild Sun-flowers—*Helianthus doronicoides*—which grows from Pennsylvania and Illinois, southward, and is quite abundant in the southwestern States and the valley of the Mississippi; this produces, in its wild state, long tubers, so like those of the Jerusalem Artichoke as to suggest that they are its wild parent. The tuber-forming habit of this species is not an accidental thickening of the root-stock, as it has been noticed several times in the wild plant, and is held by specimens cultivated in botanical gardens. The plant itself is so like *H. tuberosus*, that Gray, in his last edition of Manual, says in speaking of it: "This is probably the original of *H. tuberosus*, the Jerusalem Artichoke," an opinion in which he has since been so strongly confirmed, that he says he has "no doubt" of it. The historical evidence that the aborigines cultivated the plant is lacking; but from what we do know of their agriculture, and the well established fact that they had different varieties of squash or pumpkin, and corn, it is not improbable that they cultivated the Artichoke; indeed, a recent writer, though he does not give his authority for the statement, enumerates "Sun-flowers" as among the plants grown by the Indians. A plant so hardy and cultivated with so little labor, is one that would especially commend itself to their rude agriculture. As to its introduction into Europe, it may have been taken to France by the way of Canada, or to Spain by the way of Florida, as both countries had settlements in those parts of the new world three quarters of a century before the alleged date of its cultivation in Europe. If any of our readers in the Indian Territory have any information, traditional, or otherwise, bearing upon the use of this

plant by their remote ancestors, we hope they will contribute it, and help clear up the history—now rather obscure—of this useful plant.

Basket Items continued on page 33.

Danger to Horses in Connecticut.

The State Board of Agriculture of Connecticut—much more efficient than such bodies often are—should investigate and make public the facts concerning a plant which is dangerous, and even fatal to horses, as alleged by a citizen of their State, in papers published in the adjoining commonwealths of Massachusetts and New York. This should be done, not only as a matter of great importance to farmers and other horse-owners, but as one of scientific interest, as the plant to which these dangerour qualities are attributed, has not heretofore been known as poisonous, nor has it previously been found in New England. A knowledge of the useful or deleterious qualities of plants, especially those which grow spontaneously, is important to the farmer, but it is very essential that this knowledge should be accurate. Mr. W. H. White, of Connecticut, a copious writer for some agricultural papers, published in the "N. E. Homestead," in 1873, an account of the poisoning of horses by the "Horse-tail," *Equisetum arvense*, a plant which has the reputation of being injurious; in the same article Mr. W. mentioned that another plant, popularly known as "Mares-tail," *Hippuris vulgaris*, was fatal to horses. We at the time pointed out the probability of an error in this case, *Hippuris* being an aquatic, and an exceedingly rare one. To this Mr. W. replied, averring the abundance of "Mares-tail" in the Connecticut Valley, and that more of it grew upon "moist land" than did in the water. That the plant known to him as "Mares-tail" might possibly not be *Hippuris*, does not seem to have occurred to Mr. White; it would not be a difficult matter to determine what the plant is, as any botanist would willingly examine it for him, and he need not go outside of his own State to find some of the most skilled botanists in the country. He seems to be quite satisfied with the accuracy of his own knowledge, as he persists in his assertion, which is repeated in the "Country Gentleman," for Nov. 30th, last. He says; "*Hippuris*, 'Mare's-tail,' although Prof. Gray says it grows in water, I have seen growing in moist ground; it is a poison which proves fatal to horses, and it may be barely possible it can be mingled with hay."—Several points suggest themselves as desirable for the Board to investigate.

(1) Does *Hippuris* grow at all in Connecticut?—Mr. W. says it "is found in many towns lying contiguous to the Connecticut River, from Hartford up to Vermont."—It is very strange that no one else has observed and recorded it. A few quotations will show how rare it has formerly been considered. In his "Flora," (1824), Doct. Torrey stated: "The only American locality for this plant, with which I am acquainted, is that near Schenectady." Later, (1840), Torrey and Gray, in their "Flora of North America," say: "This plant is very uncommon in the United States."—Prof. Gray in his "Manual," (1867), gives for its localities: "New York to Kentucky, and northward; rare."—If the plant, heretofore regarded as a botanical rarity, has made an irruption into the Connecticut Valley, and suddenly become abundant, it is an interesting fact in the distribution of plants, and should be authenticated.

(2). All American authorities, as well as those of Europe, (where the plant is much more frequent than here), describe *Hippuris* as growing in the water, either wholly submerged, or with the tips rising out of the water; the only time we ever found it, the plant was wholly under water. Mr. White asserts that he has seen "more on moist land, not ponds or springs, than I ever saw growing in water."—Here is another point of interest; if this statement is verified, we have a capital illustration for the advocates of the development doctrine—a plant which everywhere else is aquatic, is in the Connecticut Valley on its way toward becoming a dry-land plant; it is being already more abundant on moist land than it is in the water. The plant should be watched, for the Mares-tail may, on dry land, develop into a Colt's-foot or a Horse-mint.

(3). Still more important is it that the Board should ascertain whether *Hippuris* is really, as alleged, "a poison which proves fatal to horses." If the plant is as abundant as stated, it is a matter that can not be too soon determined, and the facts made known. The Board should have no difficulty in procuring evidence in this matter, as Mr. W. says in the "N. E. Homestead": "and as for its growing in Vermont, and horses eating it and being poisoned, or dying after having eaten it, I have the authority of the farmers who have lost their horses in that way."—Aside from the practical importance of this question, it will be, if established, an interesting addition to our knowledge of the plant. No others of the family to which *Hippuris* belongs, are known to have poisonous or other active qualities; this, however, is no proof that the little known *Hippuris* may not be dangerous, as cases exist in other families of one member being poisonous, while all its kin are harmless.

(4). Perhaps the most direct way of coming at the matter, would be to ascertain what plant, abundant in the Valley of the Connecticut, besides the Horse-tail, (*Equisetum*), has the reputation of being poisonous to horses. As the most careful sometimes make mistakes, it is just possible that it may not be *Hippuris* at all; but it is none the less important to find out what the plant is, and what foundation there is for the statements that have been so widely published. When the plant is identified, and it proves to be something not familiarly known to our readers generally, and one that we have not recently illustrated, we shall be glad to publish its portrait, in order that it may be recognized and avoided.

Some Popular Breeds of Poultry.

The agricultural interest owes much to poultry fanciers. Those who devote their attention to fancy poultry are too often misunderstood by farmers, as well as by others. As in many other cases, where people devote themselves to some special pursuit—or hobby, as it is considered—the poultry fanciers are generally looked upon as enthusiasts, who simply amuse themselves, without conferring any benefit upon the public; an error which does the poultry breeder great injustice. In nearly every farmer's yard may be seen either some pure-bred or some crossed fowls that are much superior to the ordinary run of "barn-door" poultry. The common fowls may weigh two pounds at maturity, and may lay two or three dozen of eggs in the summer, and none in the winter. But the improved fowls, now kept by the majority of farmers, will reach an average weight of four pounds, and produce eggs, if not in the winter, at least very early in the spring, and continue late in the fall. The product of flesh and eggs is at least doubled. This result is due to the labors of poultry fanciers, who have ransacked the world for new varieties, until perhaps there are none worth having that are not now to be found in this country. The Light Brahma, the most generally popular fowl at the present day, we owe to an American poultry fancier, Dr. J. C. Bennett, of Great Falls, N. H., who exhibited a pen of them at the Fitchburg Poultry Show in 1850. Dr. Bennett procured these birds of Mr. Cornish, of Connecticut, who obtained them from a Mr. Chamberlain, and he purchased them from a sailor who brought the original fowls from India. This at least is the statement given in Wright's Monograph on the Brahma Fowls, published by the Orange Judd Co. We therefore owe the Brahmas to the American poultry fanciers, and since they started the breed on its way to popular favor, it has been improved, and now stands first in numbers and value of all our poultry. In like manner the very popular Leghorns have been introduced and improved, and now we have a new and most promising breed coming into favor, which we owe entirely to the fanciers, and that is the Plymouth Rocks. All these are fowls of general utility, valuable for their flesh and eggs. No one can become a successful breeder of poultry—indeed one can hardly succeed in any thing—unless he is an enthusiast; therefore enthusiasm, when usefully directed, is something to be commended rather than blamed. The profit derived by farmers from poultry, is now an important item in their income. The total product of fowls and eggs cannot be less than from 150 to 200 millions of dollars annually, and nearly the whole of this should be credited to the enthusiasm of poultry breeders, through whose labors it has been made possible. We would, therefore, advance the improvement of poultry by encouraging those who make it the business of their lives, and every farmer should visit the poultry exhibitions, and see that his wife and children take interest in them.

We give on our front page portraits from life, of some choice fowls that have been recently exhibited. The central figures are portraits of a pair of Light Brahmas, bred and owned by Mr. J. J. Berry of Hackensack, and which took the first premium at the Bergen Co., N. J., Poultry Exhibition. At the right of these are a pair of Plymouth Rocks, bred and owned by Mr. D. Benedict, of the Staten Island Poultry Farm, Rossville, Staten Island, N. Y. They were also exhibited at the Bergen Co. show. This breed is rapidly coming into favor as excellent layers, heavy bodied, hardy, and well-fleshed fowls. Their plumage is bluish-speckled, and very pleasing, the cock is somewhat lighter in color than the hen; the legs are yellow and without feathers. A flock of these fowls is a very attractive ornament to a well kept yard, and they promise to become a very favorite farmers' and amateurs' fowl. On the left is a pair of White Dorkings, bred from stock imported from England by Mr. Wm. Crozier, of Northport, Long Island, N. Y. At the bottom is a trio of Sumatra Game fowls, bred from imported stock, by Messrs. Benson & Burpee, of Philadelphia. These are very handsomely plumaged birds, the cock magnificently colored, and the hen jet black, with brilliant green reflections. They are great layers. These birds were exhibited at the Centennial Poultry Show, as were also the pair of Sultan fowls, whose portraits appear on the upper part of the engraving. These birds are white, with legs feathered to the toes, and with large crests. They came originally from Constantinople, where they are kept in the Sultan's palace, and are therefore called the Sultan's fowls. They are probably more curious than useful. The active competition amongst poultry breeders has tended to reduce prices for choice fowls to a very moderate figure, so that every farmer can now afford to procure a few birds wherewith to improve his common stock.

Bee Notes for January.

BY L. C. ROOT, MOHAWK, N. Y.

While bees are left in perfect quiet, as they should be during the present month, the beekeeper may be active in gaining information, preparing hives and boxes, and in other ways making ready for the coming busy season.

From the many communications I have received, I conclude that the "Notes" for Jan. '76 were of general interest, as at this season the question of "what hive to use" is receiving attention. I find from inquiries that I did not make some points so clear as I intended.

Standing or Hanging Frames.

A correspondent says: "I have referred to your Notes in the Jan. No., '76, but cannot learn from it, whether you prefer the standing or hanging frame of the Quinby Hive."—I am aware that three hives are known as the "Quinby Hive," they having been made, used, and recommended by him. In speaking of his last hive, I should have called it the "New Quinby Hive." This is the hive with standing frames, described in the Notes referred to. He farther says: "The point I am particularly interested in, is to know which of these two kinds of

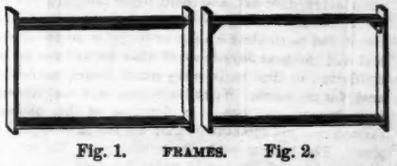


Fig. 1. FRAMES. Fig. 2.

frames you prefer, with your reasons for changing from suspended to hanging frames, if you have done so."—The new Quinby frame is made as follows: The ends are 11¼ inches long, 1½ in. wide, and ¼ in. thick. Top and bottom pieces are 18½ in. long, ⅞ in. wide, and ¼ in. thick. If the combs are to be built directly in the frames by the bees, a triangular piece, 18½ in. long, (fig. 1), should be placed under the top bar as a guide; but if combs are to be transferred to them, from other hives, a simple corner block, (fig. 2), is all that is necessary to stiffen the frame. The top and bottom pieces are nailed ⅛ in. from the top and bottom of the end pieces, and being narrower, at equal distances from each edge; a hook on the bottom of one end, made of a piece of hoop iron, will support the frame in a standing position. This makes, when completed, a frame 11¼ x 19½ in. If a smaller frame is desired, it may be made shorter. I describe the frame that I may more clearly give my preference for the use of the same, as well as to answer some inquiries as to its construction. The principal advantage of this frame over the hanging frame, is the fact that one or more frames may be placed together, making a perfect hive without the necessity of the outside case. I have only to place them on a small bottom board, with the panels at the sides, and a mat or board on the top, they

form a complete hive. The past season I have increased my stock about 60, using only the closed end frames without the outside case or hive.

With the hanging frame, if you desire to use only one frame to rear a queen, a hive must be used to hold the frame. Another advantage is manifest when we come to place the hives in winter quarters. Only the frames need be removed to the winter repository, which renders the package light, and easily handled.

Hives that will accommodate the requisite number of boxes in a good season—or the necessary supply of frames for extracting, must certainly be unwieldy to handle, and occupy too much space. Hives with hanging frames cannot be handled without the outer case, and if a special one is made for winter packing, it involves unnecessary outlay. Then, too, when bees are removed to their winter quarters, it is very important that all about them be dry. It will easily be seen that when the case is left on the summer stand, no snow or dampness can have touched the frames.

STRAIGHT COMBS.—Our correspondent asks again: "Is it as easy to secure straight combs in the hanging as standing frames, and if so, should the bottom of the hanging frame be held in place, as described in Mr. Q.'s book?"—Straight combs may be secured as easily in one as the other. Frames in all hives should be held firmly in place by some device or other. No hive with frame hanging loosely would be practicable to handle.

ROOFS.—A good roof for each hive is indispensable, and the winter months afford ample time to make and

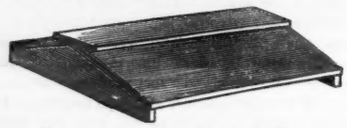


Fig. 3.—SLOPING ROOF TO HIVE.

paint them well. The one shown in figure 3 is in most general use, yet the other, figure 4, is, for some reasons, preferable. The roof described in fig. 4 is made as follows; cut three cleats, *a*, 6 in. longer than the width of the hive. Then cut ½-in. boards, *b*, 6 in. longer than the depth of the hive from front to rear. Nail the boards to the cleats as shown in the cut, placing the middle cleat about one-third of the distance from one end, and nail battens, *c*, over the cracks. This will make a roof projecting three inches over all sides of the hive. It will be seen that the middle cleat will rest on the hive near the front, and the rear one will hang over the back of the hive, giving the roof the desired slant. This form of roof is adapted to all styles of hives, but especially to those that are broader than deep, while that shown in fig. 3 is better for long and narrow hives, and carries the water off at the sides. With this style of roof, the water may all be carried to the rear of the hive. In case of a sudden dash of rain,

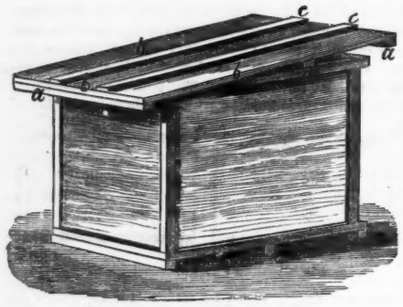


FIG. 4.—FLAT ROOF TO HIVE.

when bees return hastily to their hive, they are not hindered by the dripping of the water before their entrance.

WHEN TO PURCHASE BEES.—Mrs. A. N. N., of Rockford, Ill., asks: "Would it be preferable for me to purchase bees at this season, or in early spring?"—I always advise purchasing bees in spring. Beginners, especially, should purchase at that time.

Ogden Farm Papers.—No. 83.

BY GEORGE E. WARING, JR.

Frequent reports have recently been made concerning "Prickly Comfrey" as being a valuable plant for soiling cattle, yielding an enormous amount of green forage (said sometimes to exceed one hundred tons per acre), the leaves being removed from time to time during the season. It is a native of the Caucasus Mountains, and withstands the coldest climates. Analysis shows these green leaves to contain more than 10 per cent of nutritious matters, which is certainly a very high proportion—as much as the beet and cabbage. It is highly commended as a forage plant in England, and has been introduced with success in this country. Not only does it withstand extreme cold, but it seems to thrive remarkably well under the dry climate of our Southern States. In Virginia, plants set out in April, and growing near corn, which had withered with the drouth, gave at that time a supply of five to seven pounds of fresh green fodder to the plant. The leaves may be cut or pulled, and the cropping may be continued until heavy frosts. When a good top-dressing of manure is given to the ground, the Comfrey leaves are the first product of the soil in the early spring. Like all heavy yielders, it is of course a heavy feeder, and must be manured very abundantly. Indeed, it is peculiarly a *high farming* plant. It will pay much better to grow one acre with fifty loads of manure, than ten acres with five loads of manure to the acre.

It is planted in hills three feet apart each way, and may be planted even late in the autumn. Dig a hole deep enough to receive a large shovelful of manure, without filling it nearer than within two inches of the surface. After the heat has passed from the manure, place the set directly upon it, and cover it with about 3 inches of earth. As soon as the weather is warm enough for any vegetable growth, the plant will start rapidly. The only future treatment needed, is to keep the ground free from weeds, (which may readily be done by cross-cultivating), and giving it a heavy top-dressing every autumn. It is claimed that with sets planted in the autumn, the yield per acre of the first season will be 20 tons of green leaves, of the second 50 tons, and of the third from 80 to over 100 tons. This seems a very large story, but I hope in time to report the results of my own experiment.

Dr. Vœlcker's analysis is as follows:

	Leaves.		Stem.	
	In Natural State.	*Calculated Dry.*	*In Natural State.*	*Calculated Dry.*
Water	88.400		94.74	
Flesh-forming substances	2.712	23.37	.69	13.06
Non-nitrogenized substances:—				
Heat and fat producing matters	6.898	59.49	3.81	72.49
Inorganic matters (ash)	1.990	17.14	.76	14.45
	100.000	100.00	100.00	100.00

This analysis would give a produce of actual nutritious matters amounting to at least 10,000 lbs. per acre, for a green crop of 50 tons, equal to the nutritious matter of 15 tons of the best hay, and would be fully equal to 50 tons of corn-fodder.

If it is true that this new comer has anything like the advantageous qualities accorded to it, it will be a most valuable acquisition, especially to those who stall-feed their cattle during the summer months.

A correspondent in Wisconsin, referring to former accounts in these papers of our experience in steaming food, asks whether it proved a success. He has an 8-horse engine used for sawing lumber. This he proposes to use for grinding corn, cutting fodder, and steaming the mixed food. We steamed all of our fodder—or nearly all—from 1868 to 1873, and found a decided benefit in doing it, as during this time we had to buy a very large part of our forage, and had a great quantity of corn-fodder saved for winter use, (cured and left in the field.) Since 1873 we have raised nearly all of our hay on the farm, and our corn-fodder has—now from rain, now from the army-worm, and now from drouth—failed to furnish any excess for winter use. Our home-grown hay was cut early and stored in the barn. It was sweet, palatable, and nutritious, and would have been but little, if at all, benefitted by cutting and steaming. When we steamed corn-fodder and poorer purchased hay, we found that we got the same effect from it that we did when we used our own hay unsteamed, and the effect was not sensibly improved when we used our own hay in the steamed mixture. This indicates that the result of steaming late cut, or poor hay, is to bring it more to the condition of good hay; and that really good hay—young, tender, and sweet—is not materially improved by steaming. Probably the cellulose in good hay is naturally in a condition to be digested by stock, while that in poor hay is too much hardened by age, and needs the softening action of cooking to make it digestible. Then, too, any *slight* taint of must or mold, which would cause cattle to refuse the hay, is corrected by steaming, and the appetizing flavor of the meal or bran added to the mixed fodder, is diffused throughout the mass, and causes it to be eaten more readily. The hard stalks of corn, and the harder kinds of straw, are made more tender, and their nutritive parts become more readily available. To sum up the case: all inferior food is made enough better by steaming to pay any reasonable cost of the operation, while *good* food is already so good that it does not receive enough improvement to make steaming profitable. In such a case as is indicated by my correspondent,—where the power for cutting, and the steam for cooking are already secured, and when it would consequently be only a question of keeping up the fire a little longer, the cost would be so much reduced as to make it economical to steam under conditions where it would not pay if the operation had to bear all of its own costs. Then, on the other hand, it must be remembered that the experience at Ogden Farm was with coal at $8 to $10 per ton, hay at $16 to $22 per ton, and corn at 75 cts. to $1 per bushel. In Winconsin fuel would be cheaper, but labor would cost about the same as here, and the fodder, on which the saving is to be made, would be so low in cost that the actual saving would amount to very much less. If the quality of the hay is really *poor*, then steaming would be more important, with a view to the condition of the stock. I am asked where my writings on this subject can be had. The best will be found in the Ogden Farm Papers for 1868 to 1873, and in "The Handy Book of Husbandry," which the Orange Judd Company sell.

Incidentally to our use of corn-fodder for winter steaming, we hit upon the following plan for curing it, which seems worth repeating for the benefit of newer subscribers to the *American Agriculturist*,—and to refresh the memories of old readers. We plant in rows, about 3 feet apart, and if we have good luck, the corn stands about 6 to 7 feet high over the field,—a solid sea of green. When it is well advanced in tasselling, we cut it up and bind it into small stooks, well secured at the top, and well spread at the foot. After every high wind we go over the field, and set up and bind anew all stooks that have been disturbed. In this condition we keep it until hard weather sets in in November. Then we cut each stook loose by cutting up its still rooted members, bind it firmly around the middle, and gather it into very large stooks,—say six small ones being made into each new one. This is set up very securely, and bound as tightly as possible at the top, so tightly that there is but little chance for the weather to get in at this vulnerable point. Such stooks, from their size and compactness, need very little attention, and they are good to withstand any weather. We have generally used the last of ours late in February,—hauling them in as they are wanted for steaming. The very outside of the stook is somewhat weathered, but all except this, (probably 95 per cent of the whole), is in good condition, and is in my opinion,—and in the opinion of my cows,—as good as good hay. The quantity is, of course, very much more than any crop of hay from the same area,—I should say fully six tons per acre, if not more.

Mr. Hardin, of Kentucky, has his little joke in the "Country Gentleman" about my getting up in the night to fire-up and keep the frost out of my dairy. Fortunately it is only a joke, for we never have freezing weather inside of our milk-house. The hot-water pipes take care of that,—and they were not so stupidly provided for that they can't be trusted to keep hot all night. He says he is not so much a *deep* setter as a *cold* setter. He sets as deep as I do, and my milk is often as cold as his can be,—I have found it considerably below 40° at times. Then he advances the amazing idea, (and advances it with an authority which ought to be based on more knowledge than any one probably has), that much more butter may be made from milk set at

40° than at 50°. I have not his article before me, but this is the spirit of it,—only he makes it some definite quantity for some definite degrees. I should be sorry to use impolite language, but it may do to intimate that his enthusiasm has got the better of his judgment. *All* the cream that is in the milk will rise,—in good condition,—from milk set at 50°, and surely the lower thermometer will not put any more into it. Mr. Hardin has hit on an easy way by which those who cannot command the cold water for good deep setting, may avail themselves of the advantages of the deep system. If he will confine himself to this,—or to as much as he can prove,—he will build up a good business.

Mr. Hardin complains that in my calculation of the amount of ice needed for his milk refrigerator, I say that he recommends reducing the temperature to 40°, when he really recommended 49°. (He might have made it 50° for short.) I was misled by his reliance on the endorsement of Mr. Carter of the Pennsylvania Experiment Farm, who suggested 40° as desirable—as I, myself, think it is. Still, justice to Mr. Hardin requires that his own figures be given.

S. W. McKibben, of Augusta, Ky., referring to my account of the 1st Prize Jersey Cow at the Centennial Cattle Show, (18 years old and still in full vigor), tells of a cow of his own, which is worthy of honorable mention. She is an imported Jersey, *twenty-three* years old, fawn and white in color. She has had 15 calves since she was imported 15 years ago,—the last one in July. She is now giving something over 8 quarts of milk per day. He complains that under the rules of the Jersey Cattle Club, she cannot be entered in the Register. The answer to this is, that no Herd Book in a large country *can* be a record of quality. *Pedigree* is a matter of record,—quality is a matter of standard. No standard can be applied without the personal attention of the same person, or set of persons, and in this country this would not be possible. If we undertook to record the quality of the animals we register, the book would lose its value, and would become a tool in the hands of dishonest and unscrupulous breeders.

I am asked by a former correspondent in Maine to answer the following questions: (1.) In manuring a crop like corn, it has been our practice to manure in the hill, as well as to spread: how do you manure corn?—(2.) What is the best way of applying lime and salt to the land?—(3.) How should manure be applied to the garden?—(4.) Does it pay thoroughly to underdrain common lands?—(5.) Is there much benefit to be derived from spreading swamp muck on the soil or grass-land?

1. I should spread all of the stable manure intended for this use on the sod in the autumn or winter, and turn it under in the spring. If I wanted to use only *a little* of some special fertilizer, I should put it in the hill. If much were to be used, I should put a little of it in the hill, and spread the rest broadcast, just before the first hoeing.

2. Dissolve the salt in as little water as will take it up, and use this water to slake the lime. Then spread the slaked lime on the surface of the ground. If on plow-land, after plowing.

3. With a large shovel, from a large cart, and with the *eyes shut*—for rich is still not rich enough for profitable market-garden culture.

4. That depends. Thorough draining is costly. If the common land is to have only a poor sort of common farming, it will not pay. If it is to be treated in all respects in a thoroughly good manner, the draining of one acre will pay even if you have to sell two acres of common land to cover the cost. That is to say: one acre of really good drained land, well farmed, will pay better than three acres of poor wet land well farmed. If the method of cultivation is to be slip-shod and bad, then the draining will *not* pay. Good draining is only one step in a progress where every step must be well taken. We must not raise a good crop of hay and then let it spoil in curing, and we must not spend money to get our land ready for good farming, and leave it to travel its own road to the dogs.

5. Some,—more or less according to circumstances,—but I fancy that the benefit is more often less than the cost than many have supposed.

Science Applied to Farming.—XXV.

BY PROF. W. O. ATWATER.

Cotton Seed as a Fertilizer—Superphosphates.

Mr. C. W. S., of Miss., writes: "The loss to Southern Agriculture in the bad management of *Cotton seed* is many millions of dollars per annum," and inquires as to the best method of treating the seed for a fertilizer. He says that "if it sprouts on the land, it seems to lose all its nitrogen. It is therefore usually exposed to the weather in heaps, until it heats, and is killed. Heating seems to be essential to the forming of ammonia, but by this process the ammonia escapes nearly as fast as it is formed. Then the spot where the heap was deposited, is so overcharged with ammonia that it produces nothing but straw or stalks the first year following."—He speaks of the plan of composting with earth as excellent, but troublesome and expensive, and inquires if it would not be well to treat it with sulphuric acid, to fix the ammonia, and render the phosphoric acid, potash, and other ash ingredients more available.

This letter is of a sort that I like to get. It shows evidence of thought, and its inquiries are to the point. But let me, first of all, correct a misapprehension as to nitrogen and ammonia, frequently found in agricultural literature, and of which traces are seen in this letter, namely, that all the nitrogen of plant food must change to ammonia, before the plant can use it. The compounds of nitrogen, which occur in fresh vegetable or animal matter, in cotton seed or hay, blood or meat, are not, as such, fit for the use of the plant. They have first to undergo changes, by fermentation, putrefaction, and other forms of decay, in which the nitrogen enters into new forms of combination, and such as the plant can use. One of these, and one of the best for the plant, is ammonia; another, equally available, is nitric acid. There are other nitrogen compounds, no one knows exactly what, or how many, which plants can appropriate as food. It is not necessary, therefore, that the nitrogen of cotton seed, or of any other fertilizing material, turn to ammonia, before it becomes available. But when the seed rots, more or less will change to ammonia, and, unless some means is taken to prevent it, much of the volatile ammonia will escape as gas into the air, and be lost. And if the heap is exposed to the weather, the rain will dissolve out ammonia and other nitrogen compounds, and carry them into the soil, so that, as Mr. S. says, the soil where the heap stands will be overloaded with nitrogenous plant food, and plants grown on it will be apt to run to stalks or straw, and yield relatively little seed. Putting on dilute sulphuric acid would change the ammonia to sulphate of ammonia, which, being not a gas, but a solid, would not evaporate. But the acid would do very little toward rendering the mineral ingredients, potash, phosphoric acid, lime, etc., available in cotton seed, or any other similar vegetable material, nor would it hinder the nitrogenous or other compounds in the least from being washed away by water. Indeed, there is no other way by which the fertilizing ingredients of the cotton seed can be so efficiently or cheaply changed into forms fit for the use of the plant, as by the natural processes of decay. And if these processes are rightly managed, there will be no loss of valuable materials. What is wanted is a means for absorbing and retaining the ammonia, and other available compounds, as they are formed, and preventing their loss either by volatilizing or leaching. I have no doubt that, generally speaking, the cheapest and most efficient way to accomplish this, is by composting with either stable manure, earth, or some other appropriate material. As absorbents, muck, vegetable mold from forests, and earth, are excellent. The plan of composting cotton seed with stable manure would seem from the chemical standpoint to be very good indeed. I notice that it is very highly recommended by the Department of Agriculture of Georgia, some of whose formulas and directions for composting cotton seed with manure, superphosphates, and other materials, are given on another page.*

* See Science Applied to Farming Correspondence, p. 34.

While writing the above, a friend happened in, whose early life was spent in South Carolina. In speaking about the waste of cotton seed, he mentioned a plantation near his own home, where a pile of cotton seed, "as large as a moderate-sized barn," had accumulated during a series of years, and of which no use was ever made. I have a very vivid recollection of a long winter evening's talk I once had at the house of a friend in Tennessee, one of the largest and most substantial farmers in his region. He bewailed bitterly the lack of material to bring up his exhausted lands. What with the original cost of artificial fertilizers, and the expense of freight from the Atlantic cities, their use on his place was a questionable economy. The next morning we were about the barns, and noticed that no means whatever were taken to preserve the manure there made. It lay scattered about on the ground, to be trodden over by the stock, leached away down the hillside by rains, or escape into the air, and thus be lost to the farm.

In Circular No. 12 of the Georgia Department of Agriculture referred to, is the following:

"That it is entirely practicable to fertilize well with compost, every acre of land cultivated in Georgia, at an average outlay of $10 per ton for material not made on the farm, has been demonstrated experimentally. Each mule or horse, housed at night through the year, and fed in the stall, will deposit, with moderate bedding, one and a half tons of excellent stable manure, which, using 750 pounds to the ton, will be enough of that ingredient for four tons. Each mule will make five bales of cotton, (an average,) which will yield 150 bushels of cotton seed. After reserving 50 bushels for planting, there will remain 100 bushels, or 3,000 pounds, for manurial purposes, which, using 25 bushels, or 750 pounds to the ton, will, with the 750 pounds of stable manure, make 6,000 pounds or 1,500 pounds of each of four tons. Now add 2,000 pounds of acid phosphate, or 500 pounds to each ton, and we have four tons of compost to the mule, equal in agricultural value to the best fertilizers on the market, as has been demonstrated by actual soil test, conducted for a series of years by the Hancock Agricultural Club, by the Commissioner of Agriculture, and by various other parties in Georgia.—If farmers prefer the manipulated compounds, they will find *them* most profitable composted with stable manure and cotton seed."

Importing Nitrogenous Fertilizers vs. Producing them on the Farm.

A later circular from the same source estimates the amount paid by the farmers of Georgia for artificial fertilizers in 1876 over three and one-third millions of dollars ($3,344,982.06)! A large proportion of these contain nitrogen. The nitrogenous material comes chiefly from fish captured on the Atlantic Coast, and from the waste products, dried blood and meat scraps, of the slaughter-houses in the large cities of the New England and Middle States. A considerable amount of the phosphoric acid is obtained from bone, but more comes from the mineral phosphates mined in South Carolina or the Island of Navassa. The South Carolina phosphate rock is brought in large quantities to points on the coast of New York, Connecticut, Massachusetts, and even of Maine, where it is treated with sulphuric acid, and fish scrap added. The ammoniated superphosphates thus made are freighted back and sold to planters in the South. The latter must of course pay the cost of double transportation. Leaving the cost of transport out of account, cotton planters still pay hundreds of thousands of dollars for nitrogenous material brought from the North. If, instead, they would buy the plain superphosphates without nitrogen, carefully save their cotton seed and the manure from the fowl-houses and stables, and compost these home products with the phosphate, they might have nitrogenous fertilizers as good as they could import, and at much less cost.

One of the most cheering phases of the agricultural progress in this country is the fact that just this is being done by a good many southern farmers. Several makers of phosphates have already a large trade in plain superphosphates in the South.

What the farmer wants in these "plain superphosphates," or "acid phosphates," is soluble phosphoric acid, and he should select those which furnish it at the least cost.* High grade superphosphates are offered in the Atlantic cities at

* See Science Applied to Farming Correspondence, p. 34.

prices which bring the soluble acid at 10½ cts. per pound. I think the use of these articles is a matter worthy the attention not only of southern, but also of northern farmers, particularly those who live near the coast, where fish scrap can be had cheaply. An acquaintance in Connecticut lately bought a lot of the latter at rates which furnish him nitrogen at probably not far from 12 cts. per pound. By mixing this with the acid phosphate, he can make a nitrogenous superphosphate, the nitrogen in which will cost him perhaps 15 cts., and soluble phosphoric acid 12 cts. per lb., while he would have to pay 20 to 30 cts. per lb. for the nitrogen, and from 12 to 18 cts. per lb. for the soluble phosphoric acid in the better sorts of nitrogenous superphosphates offered in the market.

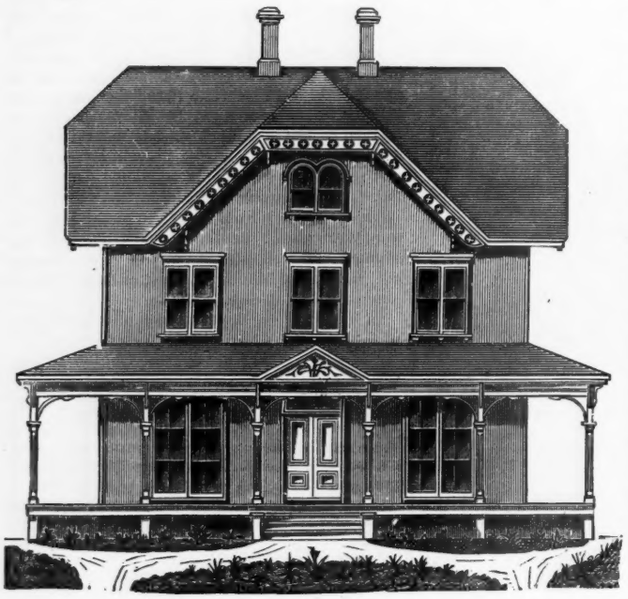


Fig. 1.—ELEVATION OF FRONT OF HOUSE.

A Country House, Costing $2,800.

BY S. B. REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

This plan is somewhat similar in style and materials to the one in the *American Agriculturist* of January, 1876. The changes here indicated adapt it to a more southern climate, such as larger window openings, more piazzas, and placing the domestic rooms at the *rear* of the main building....**Exterior,** (Fig. 1).—"Double Front" houses, (as those having their front entrance in the center are usually called), may face any point of compass, and are adapted to almost any situation. They appear best when located at sufficient distance from the road to allow extended, neatly laid-out approaches, and thus give an air of retirement....**Cellar,** (Fig. 2).—Hight 7 feet. Full size of the main building, with window openings on every side....**First Story,** (Fig. 3).—Hight of ceilings in main house 11 feet; in the wing 9 feet. The apartments embraced in the main house are unusually large, airy, and pleasant. All the windows open down to the floor, and are protected from sun and rain by the piazza. The Hall has a wide entrance leading from the piazza, and contains the principal flight of stairs. The Parlor and Living-room are of equal size, (14x24 feet), have windows looking in three directions, and have open fire-places in each. The rear entry occupies part of the main house and wing, its hight of ceiling is determined by the platform of the main stairs. It communicates conveniently with the rear piazza, main hall, living-room, kitchen, cellar stairs, and a closet. In the wing are a kitchen, work-room or summer-kitchen, butler's pantry, and two closets. The kitchen communicates with the living-room through the butler's pantry, which is "dresser finished" with drawers and shelving. The work-room is furnished with a pump, sink, and two stationary wash-tubs. If desired, a bath-room may be placed in this wing, and fitted up with the necessary plumbing, as shown in the Dec'r plans....**Second Story,** (Fig. 4).—Hight of ceiling 9 feet. A hall, 3 chambers, a bed-room, and 4 closets are the divisions of this story. The stairs leading to the Attic are placed above those of the first story, with a door at the foot....**Attic.**—The estimate provides for a floor in this, and for casing the 4 pair of windows, but it is otherwise left unfinished. Four or more bed-rooms may be made in this story if desired....**Construction.**—The materials are indicated in the estimate. The foundation walls show 2 feet above the ground. The timber is framed and raised in the most thorough manner. The beams are placed 2 feet apart from centers, and bridged with one row of "cross-bridging" in each span. Observe that the main posts are 25 feet long; this includes the whole hight from bottom of sills to top of plates, and allows for 4 feet of inside breastwork from the attic floor to foot of main rafters. The main roof is set at an angle of 45°. The "open worked" barges in the pediment, (fig. 1), are of 1½ inch plank, 16 inches wide, pierced in simple figure, and require only one set of patterns for the 4 gables. The piazza rafters show in their ceilings. Perforated pediments in each side allow the escape of heated air from under the roofs. The columns are "boxed," 7 inches square, and chamfered. The spandrells are scroll-sawed from 3-inch timber. The two full stories are hard finished on two coats of brown mortar and seasoned lath. All doors are paneled, and all architraves in the main house are double molded; in the wing single molded. All sashes are 1¾ inch thick, and glazed with second quality French glass. The parlor and living-room have marble mantles; the chambers have marble shelves resting on stucco trusses. The main stairs have an 8-inch octogan newel, a 2¼x4½ molded hand-rail, and 2-inch fluted balusters, all of black walnut, as also are the saddles to each room. All knobs, roses, and escutcheons are of white porcelain. All wood usually painted has two coats of best paint, in shades to suit the owner's taste.

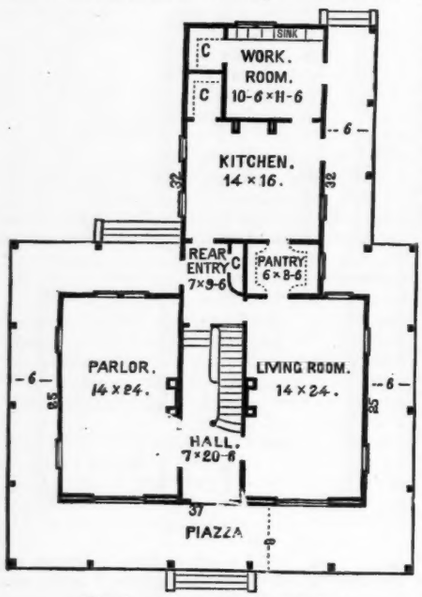


Fig. 3.—PLAN OF FIRST FLOOR.

Estimate of Cost:

137 yards Excavation, complete, @ 25c. per yard	$34.25
52 perches Stone work, @ $2.75 per perch	143.00
6,000 Brick, furnished and laid, @ $12 per 1,000	72.00
44 feet Blue Stone, @ 30c. ₱ ft	13.20
623 yards Plastering, complete, @ 35c. per yard	218.05
7,125 feet Timber, @ 2c. per ft.	142.52
viz. 1 Sill, 4x8 in. x205 ft. long. 90 Beams, 3x8 in. x15 ft. long.	
10 Posts, 4x8 in. x25 ft. l'g. 15 Beams, 3x8 in. x17 ft. long.	
2 Girders, 4x8 in. x25 ft. l'g. 4 Valleys, 3x8 in. x 23 ft. long.	
1 Tie, 4x6 in. x124 ft. long. 40 Rafters, 2x5 in. x20 ft. long.	
1 Plate, 4x6 in. x205 ft. lg. 1 Piazza, 3x8 in. x 370 ft. long.	
1 Piazza, 3x5 in. x332 ft. long.	
500 Wall Strips, @ 13c. each	65.00
360 Siding, @ 28c. each	100.80
Materials in Cornices, corner boards, etc.	40.00

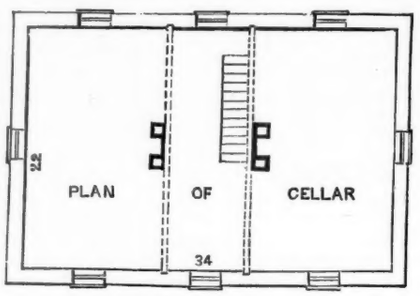


Fig. 2.—PLAN OF CELLAR.

360 Shingling Lath, @ 6c. each	21.60
65 bunches Shingles, @ $2 each	130.00
134 Hemlock Boards, @ 16c. each	21.44
15 squares Tin Roofing, Gutters, and Leaders, @ 8c. ₱ ft	120.00
360 Flooring @ 28c. each, $100.80; Stairs, complete, $90	190.80
Piazzas, except roofing, complete	150.00
8 Cellar Windows, $48; 20 Windows, $300	348.00
28 Doors, complete, @ $10, $280; Closet finish, $20	300.00
Mantles and Shelves, $75; Nails, $20	95.00
Painting, complete, $200; Cartage, $35	235.00
Pump, Sink, and Range, $60; Incidentals, $49.34	109.34
Carpenter's labor not included above	250.00
Total Cost, complete	$2,800.00

The following detailed estimate of the cost of Windows and Doors, "complete," are given in answer to several inquiries, as to what is included in the published lists:

First Class Windows, complete.—For a 2-7x6-2 window, with paneled back, and full double trim, viz:	
22 feet running lumber in frame, @ 4c	$0.88
4 pulleys	.14
28 lbs iron weights, @ 2½c.	.70
Sash Cord, 8c.; Screws, 3c.	.11
22 ft. of 8-inch trim, @ 8c.	1.76
Paneled back materials	.48
Sash, glazed, counter checked and hung	2.8
Blinds with fastenings	1.80
Materials in outside cap	.61
Nails, 8c.; Labor, $4	4.08
Total	$13.39

Second Class Window, complete.—For a 2-7x5-2 window, with plain single molded trim, viz.:	
20 running feet of lumber in frame, @ 4c	$0.80
4 Pulleys, @ 40c. ₱ dozen	.14
26 lbs. Sash Weights, @ 2½c	.65
Sash Cord	.08
Screws	.03
16 ft of 5-inch trim, @5c.	.80
Sash, glazed, counter-checked and hung	2.16
Blinds, with fastenings	1.56
Nosing, apron, and drip	.20
Nails, 6c.; Labor, $2.50	2.56
Total	$9.08

Where there are an equal number of each class, I should put their cost at $11.23 each, and where the second class preponderates, as is usually the case, the *average* price is reduced accordingly.

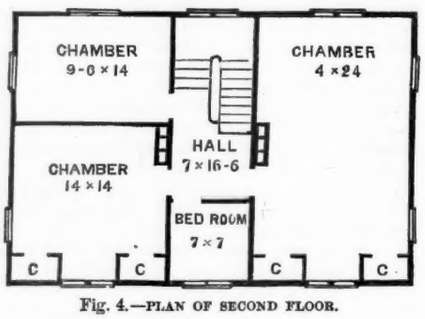


Fig. 4.—PLAN OF SECOND FLOOR.

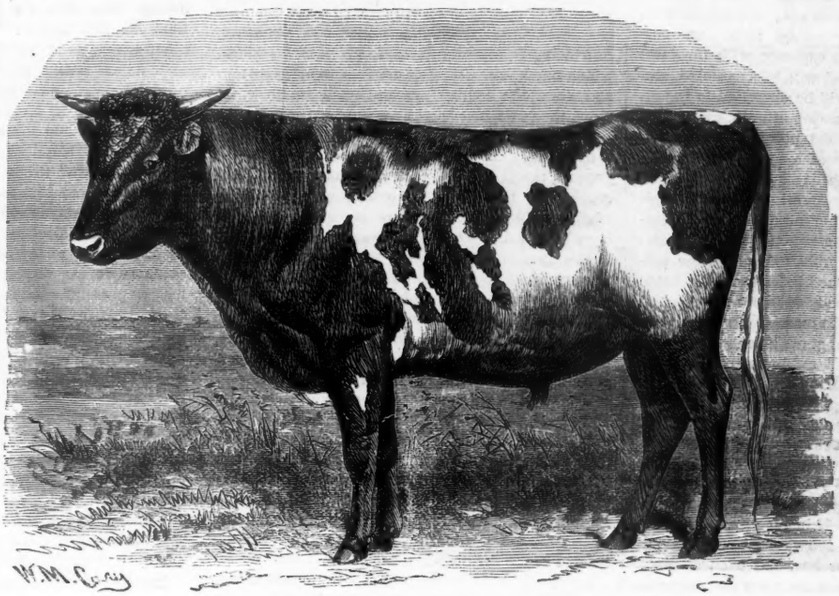
First Class Doors, complete.—Double-faced, 2-8x7 ft. full trimmed:	
Door, 4-paneled, at fac'y	$2.50
20 ft. running trim, 8-inch, @ 21c	4.20
Saddle	.15
Butts and Screws	.16
Locks and knobs	.50
12 running feet Base, @ 9c.	1.08
Nails, 6c.; Labor, $3	3.06
Total	$11.55

Second Class Doors, complete.—Single-faced, 2-6 x 6-8, single trim:	
Door, 4-paneled, at fac'y	$1.90
18 feet running trim, @ 12c	2.70
Saddle	.15
Butts and Screws	.15
Locks and knobs	.35
22 running feet Base, @ 7c.	1.54
Nails, 5c.; Labor, $2	2.05
Total	$8.84

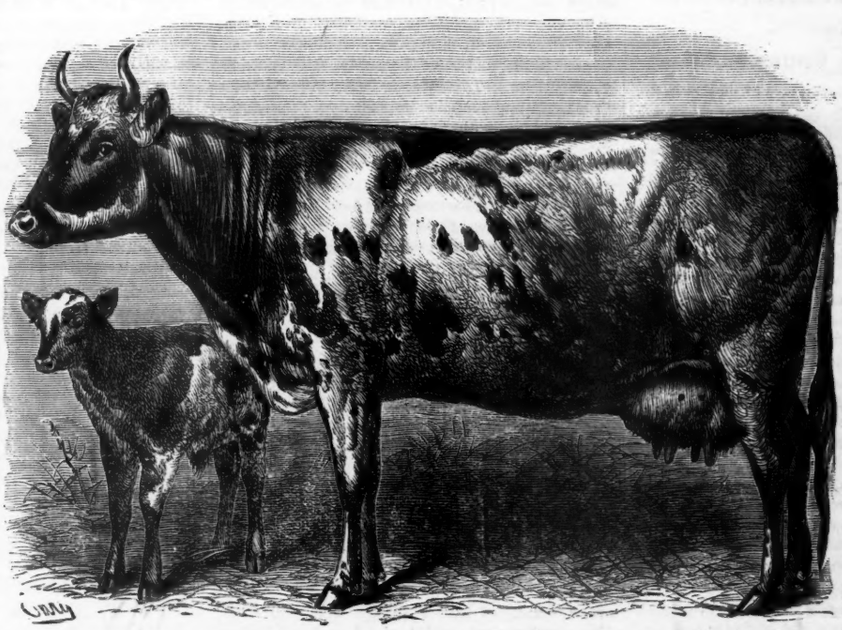
It will be noticed that the item of *Base* is included above estimate for doors. The figures (22 feet) are an average per door, deduced from careful calculations, and are introduced here for the purpose of aiding any one in readily making up an estimate for a whole building.

Ayrshire Cattle.

The prominence given of late to Short-horn and Jersey cattle, and the popularity amongst fashionable breeders which these breeds of cattle at present possess, have tended to throw into the background other races, which deserve at least equal consideration from farmers and dairymen. We do not now, nor is it probable that we ever shall, possess any one breed of cattle that will combine in itself all the good qualities or peculiar advantages, which would make them universally desirable. The great difference in tastes and necessities, not to speak of prejudices, on the part of those who keep cows, will always tend to restore to popularity any breed which possesses value for a particular use, no matter how much it may have been overshadowed by the temporary ascendency of other breeds which may have sprung into fashion or repute. Just now we hear of nothing but Short-horns, Jerseys, and their pedigrees, points, premiums, and enormous money values, or reputed values. While there is no objection to this, so long as it does not operate injuriously to other deserving breeds, and tend to cast reproach upon them, as inferior in intrinsic value, yet, when there is danger that public opinion may be misled by it, and prejudices created, it becomes objectionable, and is to be guarded against. As to dairy cows, while the Jersey is unsurpassed by any other breed for the place it holds, yet that position is, to some extent, narrow, limited, and strictly defined. As a butter cow the Jersey is probably the best that can be obtained. Having been bred for many years strictly with regard to a yield of very rich milk, she fills her place better than any other race of cows can. But as a dairy cow for the production of butter and cheese, the Ayrshire cow has been carefully bred for many years, and before the Jerseys became popular, had gained a high reputation, which has never been lost, and probably never will be, so long as care is exercised in her breeding. It is not possible that the Ayrshire cow can be displaced by the Jersey, nor that any injurious competition can arise between the two for a lengthened period, because the best and fittest for any particular service will in use always keep its place. Therefore we expect to see the Ayrshire cattle become before long as popular as they ever were, and occupy the high position in public estimation, to which they are entitled. The Ayrshire breed is one of the oldest in existence. As with every other breed of valuable cattle we possess, it owes its origin to a mixture of races. It is possible to improve a race by good feeding, and care and skill in selecting breeding animals; but to change entirely the character of a breed for the better, without the crossing of other breeds upon it, would be unparalleled in the history of our domestic cattle. The Ayrshire originated from a cross of the Dutch cattle upon the native race of the locality, and are related to the Short-horns through their ancestry. A hundred and twenty-five years ago, cattle were brought into Ayrshire from the English county of Durham, where the Short-horns (formerly called Durham cattle) were originally bred; and the progeny of these were soon scattered throughout Ayrshire. Care in breeding and management helped to produce what soon became a very valuable breed for the dairy. They did not surpass the Short-horns, for in those days this breed was noted for its dairy qualities; but they became more valuable for the locality, in which they had grown up, and for the purposes of their owners. The locality was a moist pastoral country on the south-west coast of Scotland, and the climate was such, that during the winters some hardships must be endured, such as severe wintry weather, and poor feeding, when the pastures were bare. The purpose for which the cattle were used, was the butter and cheese dairy solely; the production of beef was not an object, only the old and inferior cows being fed for the butcher. The growing demand for these dairy products stimulated the growth and improvement of this breed, and they in time became noted as producing more milk and butter, *for the same quantity of feed*, than any other breed in existence. This quality they still possess, and the Ayrshire dairy district still retains its reputation for its dairy products. The method of breeding usual amongst Ayrshire dairymen has resulted in the production of model dairy cows. In respect of form, Ayrshire cows are in no way inferior to the best Jerseys. The style of bull chosen by the Ayrshire breeders, has been selected with regard to this desired form. A bull of somewhat feminine characteristics has always been preferred. A fine head and neck, broad hips, and full flanks, are desirable, and a very deep dew-lap, and roundness of the hindquarters, are not desired. The bull, of which we give a portrait on this page, will serve as a very fair representative of this breed. The engraving is from a photograph by Schreiber, of Philadelphia, and due allowance must be made for the inevitable defects of photography, which, however, do not misrepresent the animal. This bull ("Casper," No. 18 in new Vol. of Ayrshire Herd-Book) is the property of Messrs. Benson & Burpee, of Philadelphia. He took 1st prize at the Burlington Co. Agricultural Society's exhibition, at Mt. Holly, Oct., 1875, and also in 1876. He is out of "Eileen A'Roon" 1116 by "Snap" 1477, winner of 1st prizes wherever shown. The Ayrshire cow having been bred for one specific object, which has been most completely attained, may be taken as a model of what an excellent milk cow ought to be. In choosing a milk cow, the points to be observed should be as follows: a head small, long and narrow at the muzzle; horns small, fine, and translucent at the surface, bent gracefully forwards, and placed widely from each other; the eyes not large, nor prominent, but full, brisk, and lively; the neck long, slender, and tapering towards the head, with a little loose skin below; the shoulders and forequarters light and thin; the hindquarters large and broad; the back straight and wide across the loins and hips; body deep in the rib, and on the whole wedge-shaped; tail thin and long; legs fine in the bone, and short, with firm, neat joints; udder square and capacious, but not hanging low, reaching well forward, and not fleshy, but loose when empty; teats moderately



AYRSHIRE BULL "CASPER."—*Owned by Messrs. Benson & Burpee, Philadelphia.*



AYRSHIRE COW "MAGGIE STEWART."—*Owned by Mr. Wm. Crozier, Northport, L. I., N. Y.*

long and small, pointing outwards, and set wide apart from each other; milk-vein large and prominent; skin loose, thin, and yellow in color; hair soft, fine, and well covering the skin; the figure, when in good condition, handsome and well proportioned, with no aptitude to take on flesh or fat, and finally the disposition should be gentle, docile, fearless, and not easily disturbed. An animal with such a structure must be a good feeder, and possess an excellent digestive capacity, with no waste places upon which her food will be expended, and all the animal functions will be exercised in the direction of profitable production of milk. The Ayrshire possesses all these good points in a remarkable degree. While she is of a very quiet disposition, she is, like all high bred animals, nervous when ill-used or under restraint, and resents such treatment by withholding her milk, or by manifestations of anger. Kind and gentle treatment is therefore necessary with the Ayrshire cow, and the petting and fondling which the kind owner of a beautiful animal is always ready to bestow upon her, will render her very easy to manage, and perfectly docile. The portrait here given is taken from life, from "Maggie Stewart," an imported Ayrshire cow, owned by Mr. Wm. Crozier, of Northport, L. I., N. Y. When standing for her portrait, she had her week old calf by her side, and was milking 23 quarts in the day. Mr. Crozier writes of the cow "she is the handsomest Ayrshire I ever saw, and the calf is a perfect gem. The cow is perfect in every way, and her milk, by actual trial in the glass, produced on 8 in. in depth, 1¼-in. of cream. This is nearly 25 per cent. When she was at the Centennial, I refused many offers for her, and even declined to name a price to a prominent Canadian breeder, who wished to purchase her. I want the best, and therefore could not dispose of her."—Mr. Crozier is well known as one of the first and most successful breeders of Ayrshires in the United States, and while he may be pardoned for being somewhat enthusiastic regarding a favorite cow, nevertheless, from our own knowledge of the animal, we would not attempt to reduce his estimate of her excellence.

Among the Farmers.—No. 12.

BY ONE OF THEM.

Pastures.

We have no such pastures here as I was brought up among; at least I encounter no such clayey loams, in which a score of nutritious pasture grasses dispute the possession of every inch with white clover and daisies, often fairly crowding out the latter, in fact always doing so, if helped by a little manure. Among our sands and gravels, and light loams, if it were not for the brambles, huckleberry bushes, and straggling cedars, which are mowed off and burnt every few years, I doubt if the grass would not run out altogether, and give place to moss and weeds. Among the shrubs named, the grass gets growth enough during the spring to form an excellent mulch to the soil, if the weather is very dry, thus enabling it to weather the drouth. And from these centers it extends itself rapidly on all sides, both by seeds and by "stooling," so long as favorable seasons last. Occasionally we find land so good, through water in the subsoil, or from some other reason, that it does not need tillage, but gives good return in pasturage year after year. As a rule, however, we have no objection to plowing our pasture land. I have seen farmers in this valley plow in July, sow buckwheat, and, after taking off a good crop, leave the land to grow up to grass and weeds. The pasture is improved by the practice, and fairly reëstablishes itself in a year or two.

After a clay soil is once filled with clover roots, it will hold a sward for years, provided only it be closely cropped in the growing season, not fed too early in the spring, nor too late in autumn. Rolling in April or May, and a top-dressing of plaster in July, encourage, stimulate, and fix it in the way of well doing wonderfully. Leachy soils require very different treatment. The best thing for our gravelly and sandy soils that I know of, is swamp-muck, composted with lime and ashes. It is hard to spare the ashes for pasture lands, but we can easily get the lime, and gas-house lime answers very well. The application is best made in autumn. Last season those who had, or could hire

Bog Meadows,

considered themselves fortunate. I have one of a few acres, through which a brook flows, or rather, in which a brook originates from sundry springs, which never fail. We pasture this in early spring, and when the coarser grasses begin to grow, remove the cows, and let the grass grow for bedding. By the time that haying is over, the swamp-grass is fit to cut. On account of the roughness of the ground, much will, of course, remain uncut, and much grass that cows will eat, grows around the edges and in the shrubby clumps which have never been banished. When the cows spend a few days in this meadow, they always worry, try the fences at every weak spot, seem to spend half the day in restless meanderings, but invariably give more milk. Why it is, I can only guess, in fact am at a loss, for they have water enough in every pasture, they fill themselves equally well elsewhere, and certainly relish their food much better. The past season the swamp-grass has been unusually green and sweet, as well as more abundant, than common, which is owing to the fact that there has been much less water in the swamp than usual.

Throughout this region the dry weather has enabled farmers to get at the swamps, both for clearing off brush and bogs, preparatory to making use of the land, and for the sake of getting out the peat or muck for manurial purposes.

I almost dread to reclaim my swamp-meadows, since they have proved so exceptionally valuable, but I think that after they are fairly brought under plow, and laid down to grass, I can still, by some simple system of irrigation, secure grass in the driest seasons.

Benefits of the Drouth.

One of the manifest benefits of the drouth was the excellent condition of the fall pasturage, and the timothy meadows. The grass looked dry and brown enough all summer—but it lived, and the autumn rains brought it forward bouncingly. The extreme dryness of the surface of the soil is said to cause the water, as it is evaporated off, to bring up from their retreat in the subsoil, soluble salts of various kinds, and leave them where the roots can get at them. This accounts for the vigorous growth, but so does also the fact that at the gradual coming on of a period of drouth, it affects plants much as the winter does. They retire as into winter-quarters in July, and rouse themselves in October much as they are used to doing in May. So far, however, I observe no tendency on the part of Timothy, Orchard, June grass, and their kindred, to throw up flowering stems, but only leaves.

"Apple-wine"—Cider Making.

I fell in with Dr. Hexamer, the other day, not having seen him since he told me the story of his cider at "the Centennial." He had seen the account in my letter, but having narrated his experience to sundry persons, did not suspect me of the authorship. It was just in the middle of the apple harvest, so I drew him out to speak of his cider-making, and the facts elicited will, I am sure, be read with profit. I have known, first and last, quite a number of famous cider-makers—men who, in their little circles, were oracles upon the subject of cider, who sold their crop of red-streak cider bottled, or whose russet or pippin cider was the *ne-plus-ultra* in the opinion of the wiseacres of Hartford or Norwich or Newark—and without exception the old fellows each made a profound secret of some part of his process. One "fined" with eggs, and one with isinglass, one hung a piece of beef tied to a string to regulate the fermentation, and, as said before, each one had his pet mystery which was to die with him, to be bequeathed to his heirs, or perhaps sold. —Well, Dr. Hexamer's success depends upon no secret; he seemed delighted to tell me his processes, and hopes that I will succeed as well as he does.

Grinding.—Only sound ripe apples are used, decayed and green ones are thrown out—and so are very wormy ones. They are *crushed*, not grated. *No grating mills make good cider.* That is—really good cider can not be made from grated or pulped apples. The best cider-mill the Doctor has ever used is Daniell's, a mill, excellent in principle, but which, like too many other first rate things was not well made, and so proved a failure except in a few hands. The Doctor's mill was useless half the time the first season. The cogs broke out, and other evidences of insufficient strength interfered with its use until a good part of the machine was re-cast, heavier and of better iron. With one horse, using this mill, he has crushed a barrel of apples a minute, and made 10,000 gallons in a season. The usual product is nine gallons from a barrel of common apples—but the Roxbury Russets, from which his choicest cider is produced, do not yield over five or six gallons to the barrel.

He insisted also on absolute cleanliness; and though he did not enlarge, I am satisfied that the chickens do not run over his apple heaps, nor do men tramp across them; that mill and press are not stuck up with decaying souring particles of fruit, nor is oil dripped about in greasing the screws, etc.

Pressing.—With crushed apples there is no need of press-cloths, but the cheese is laid up with very little straw on the outside next the frames, and when all the juice has run out by the first pressure, he finds it so solid that, the frames being removed, the edges, six inches in width, can be cut off with a hay-knife and piled on the top, and the cheese given another pressing, by which several gallons more of cider will be gained. This of course without replacing the frames. The last and severest pressure gives the clearest and best juice.

Barreling and Racking.—As fast as it runs off the juice is placed in thoroughly cleaned, once used cider barrels. These are preferable to spirit barrels, for there is always a perceptible flavor of the spirits remaining. Sherry or Cognac casks are less objectionable. The first fermentation soon commences, and in a week or ten days is sufficiently over for the cider to be racked off into other barrels, with which still greater pains are taken, and these being filled full are closed up, and in them the cider remains until spring. Once a fortnight the barrels are opened and filled up full. There is a constant evaporation through the pores of the wood, and in some cases several quarts of cider will be required. This is a very important matter, for not only might the air find access, and thus start the formation of vinegar, but mold would soon form upon that portion of the barrel not covered with cider, and a musty or stale flavor would be perceptible. The object of racking is to remove the cider from the lees which, in time, impart their own bitter taste to it, and this first time, especially, to withdraw it from the influence of those particles of apple which may have escaped the strainer, as these soon undergo a putrefactive fermentation which destroys, or effectually conceals any pleasant flavors.

Shrinkage.—This amounts, in a good dry cool cellar, to about three per cent per annum; in a moist cellar of course it would be less—but the cellar should be quite dry. The rule for a wine-cellar is, that there must be no part of the wall so moist that you cannot light a match upon it, and dryness is quite as important for cider as for wine. The shrinkage must constantly be made good, for the reasons already stated; to this end certain barrels of cider are set aside, and all the barrels and casks examined and filled up from these once in two weeks.

Cider-years.—The quality of the cider of different years varies greatly, perhaps as decidedly as do the different vintages. Dr. Hexamer's experience is of course limited. His first cider of extraordinary excellence was that of 1870; then that of 1872 was very good, but not equal to it. The next two years produced cider of poor quality, but that of 1875 promises very well, and this year there has been an unusual amount of sunshine and good ripening weather, so that it would seem as if the cider could hardly fail to be first rate. It cannot be told, however, until a year from this time, and even then imperfectly. There has been no year equal to 1870 for a long time, five or six years at least. If therefore we have three good cider-years in a decade we

should be satisfied. The excellence of the cider depends upon the quality of the apples.

The Spring Racking occurs before the cider works, as it will when warm weather comes on, say about the last of May. It is well to do it, as occasion suits, any time from the last of March to the early part of May. At this time the barrels into which it is placed should be selected with the greatest care. When newly emptied Rhein wine-pipes can be obtained, nothing is better. They hold about 160 gallons, and impart no foreign flavor which is perceptible. The little flavor they might give would be considered as an improvement.

Fermentation goes on for a long time constantly in cider, but very slowly,—the slower the better, hence large casks are preferable, as their contents are less easily influenced by changes of temperature, and fermentation is more regular. So long as there is any turbidity, the fermentation has not ceased. During the first winter, when it is quite active, the bung-hole should be closed with a cork, in which one end of an inverted ∩-tube, (or siphon), is placed, the outer end being in a bottle of water. The object of this is to allow the carbonic acid from the barrel to escape, but to prevent the air flowing back when active fermentation ceases. The U-tube should be used again after the spring racking, but as soon as the more active fermentation is over, the casks may be bunged up.

The cider is racked again when it is a year old, and after that once a year until it is four years old, when it is fit to bottle. It is usually clear at three years old, or very nearly so. At one year, cider from apples as sour as Roxbury Russets, will be quite sweet, a large part of the sugar still remaining, it being not yet converted into spirit and carbonic acid.

No fining of any kind is used. It always injures the flavor, and so "flattens" the cider that it never recovers. Cider is more sensitive to foreign flavors than wine, hence there should be nothing but cider and apples kept in the cellar with it, and this is the Doctor's practice.

I have taken a good deal of space to tell the gist of our conversation, and I really hope that many of the readers of the *American Agriculturist* may be encouraged to produce cider which will be equal to good hock at three or four years old. This particular portion of New Jersey used to be famous for its "Apple Jack"—I rejoice that the old distilleries are seen in ruins, here and there, all about. I do not know of a single one now in operation—and sincerely hope that "Jersey lightning" may soon be known only historically. The production of

Good Cider Vinegar

is so remunerative, that it probably does not pay to distill the cider any more. Yet there seems to be little trade in vinegar. All the inferior cider, that left with the lees when the cider is racked, properly handled, makes fair vinegar—but nothing is truer than that the best cider makes the best vinegar. It also needs age, for with it it gains not strength, but flavor, and a certain unmistakable quality which makes it valuable.

Poland-China Pigs.

I expressed an opinion, or rather a surmise, that this so-called breed of swine was not so fixed in its characteristics, as it should be, but that it possessed the inherent tendency of cross-breeds, before they become well established, to revert towards one of the original breeds. I have had some correspondence lately with a successful breeder of these pigs. He thinks the "tendency is to drift towards the Berkshire," and not towards the coarser of the original breeds—at least I must admit that his pigs show that disposition. Judicious breeding will correct this "drift"—whichever way it tends.

Testing out-crosses in Breeding.

It is no more important with pigs than with other kinds of animals to seek crosses no way related to one's own breeding stock; then to test the progeny one year or more to see if the cross "nicks" well, before incorporating the blood with that of the herd or flock. Many a fine herd of cattle, flock of sheep or pigs—or excellent strain of poultry, has been seriously injured by the introduction of males judged of simply by their beauty, and by their pedigrees perhaps, without putting their qualities to a preliminary test. There are comparatively few persons who have

True Breeder's Instincts.

The science of zöotechny has indeed its accurate rules, and axioms, but in the application of them there is great scope for the exercise of judgment. A good salesman is rarely a good breeder, for he first makes himself believe in the extraordinary excellencies of his own stock, and then he convinces others that they are as wonderful as he thinks them. Such a man needs scales of points and rules, and the letter of the law, to tell him the qualities of his own cows and pigs and poultry. The real breeder values he knows not why, judges he knows not how, long before he brings out his scale of points, or studies disqualifications. He knows what crosses will "nick" well, by instinct; at least working by his own ideas of the fitness of things he rarely fails. When he will allow himself to be guided by the principles of breeding, as held by its most enlightened expounders, he is unsurpassed. Such a man is a boon to any agricultural community, and with wealth is, or is likely to be, prominent as a breeder of pure blood stock. The scores of people without this instinct, who set themselves up for breeders, merely because they think they can make money, inevitably fail. They would do well at

Raising Grade Stock,

which is legitimate farming. It is vastly better to raise superior grade animals, and to have one's herd constantly improving for generation after generation, than to attempt to breed full bloods, and see the heifers (or the pullets) one year after another inferior to their dams. The average of grade animals, or of cross-breds, are so uniformly superior to average full-bloods, in all useful qualities, that it is hard to find an exception to the rule.

Keeping Poultry on a Large Scale.

I have never done it, but there is in the vicinity of large cities such a constant temptation to do it, that several of my neighbors have been led into keeping large flocks, and thus experience, of one sort or another, has accumulated, and become public property. I consider a flock of two hundred hens a large one—too large as a general rule. Such a flock was kept by R—. He had besides several hundred pigeons, and a flock of turkeys. They were common hens, Light Brahma blood preponderating, had all they could eat of damaged grain, wheat screenings, hot buttermilk, thickened with bran, with pork and beef scrap-cakes to pick at. For several years they did admirably, but that terrible scourge, the chicken cholera, broke out in the flock, and its destruction was inevitable. "At one fell swoop" all the healthy ones were killed and marketed, and the rest—*composted*. The pigeons escaped. There was profit in this operation, but it required nerve—more than most men have—to kill off a lot of hens, laying eggs worth 4 cents, or even 5 cents, a piece, in the very midst of the most profitable laying season. There is, by the way, a good deal of profit in pigeon-raising. Well fed they will not trouble the gardens and oat-fields, and they will bring a good price dead or alive.

Similar cases to the one just mentioned, which resulted disastrously, might be mentioned, as occurring on every hand. S— built a nice hennery, capable of accommodating 1,000 laying hens; they were divided into flocks of 100 each, perhaps, or were to be so divided—few of the flocks ever reached that number. About 300 hens were bought in the neighborhood, at about $1 each. They were good ones, young, well selected, and of all breeds. They began to lay. Eggs were 5 cts. a piece, (55 to 60 cts. a dozen). The cost of feed, care, shipping, and marketing, was comparatively insignificant. Our friend was a reader. He took pains to do as the books said. He was not above taking counsel, but he took little. His profits began to excite him. The hennery was fast paying for itself, and was barely one-third full. He filled, or began to fill it, with carefully selected hens and pullets, found in New York markets. This was fatal. Catarrh of the most infectious or contagious kind, known as *roup*, broke out, and went from flock to flock. He went through a terrible siege—nursed the poor things night and day, following the most approved systems of treating the malady—but all in vain. Egg production almost ceased. The odor in his cleanly houses was insupportable. He was worried past endurance, and—gave it up!

There seems to be a fatality about it, almost, yet

A Few Succeed.

There is F., for instance. He told me that his 250 hens brought him in $2.50 each, clear profit every year. They are, I believe, in one flock, at least I do not remember any separation of the yard or buildings. They have the range of a large barn-yard, and at times of the lawn and farm. The houses are simple, warm, and light. They seem to be exceedingly dirty, and pervaded with an almost stifling atmosphere. This is the secret of success. Dusting boxes are located in all parts of the long range of hen houses. Lime, ashes, and fine earth are kept in them, and this the chickens flout and fling into the air in clouds. It pervades every corner—lies in drifts almost on unused roosts, breaks down the over-loaded cob-webs, and not only drives lice away, but seems to give vigor and health to the fowls. Otherwise the fowls are not peculiarly treated. They are of laying breeds, principally Leghorns, and he would be glad to increase the number, if he could buy just such as he wants at reasonable figures. He raises most of his stock, but has never been able to raise as many as he needs. This case offers real encouragement to egg raisers, for I certainly do not see any reason why any other person should not succeed as well. I would, however, separate such a yard into flocks of fifties or thereabouts, after considering R.'s experience, and that of many others.

How to Manage Night-Soil.

The fertilizing properties of night-soil are well known. The principal reason why this valuable material is neglected and permitted to go to waste, is the difficulty of handling it. If improperly handled, it is disagreeable and difficult to apply to the uses for which it is best adapted. There are many cases in which it could be made use of very conveniently, if rightly managed. In country towns and villages it is difficult to dispose of it, and it becomes a serious nuisance to householders, and a detriment to the public health, when it ought to be turned to profitable uses. In some other countries this refuse matter is eagerly collected and carefully used by the farmers. The methods employed in England, Germany, and France, might very well be adopted by us, and a large quantity of fertilizing material be gathered. By the methods there in use the night-soil is easily handled and prepared for distribution upon the land, or for mixing in composts. Arrangements are made with persons in towns and villages who wish to have the soil removed, and the time being fixed (this is always in the night, from which circumstance the name given to the material is derived), wagons with tight boxes, or carts, are sent to the place. Carts are mostly used, as indeed they are in Europe for most of the farm work. The carts, or wagons, carry out a quantity of earth, chopped straw, ashes, or such other absorbent as may be conveniently procured, and some sheaves of long straw, or else the ashes or other absorbent used, which is frequently the sweepings and scrapings of streets, is prepared upon the ground or near by. This material is then disposed in the form of a bank enclosing a space of sufficient size to hold the night-soil, as shown in figure 2. A reserve heap is kept to be mixed with the night-soil as it is emptied into the place prepared for it. Wheelbarrows with tight boxes are generally used to convey the soil from the cesspool. When the whole has been removed from the cesspool, the cut-straw is mixed in and the banks of earth are turned over upon the pile, which can then be handled with shovels or forks, and is ready to be loaded into the wagon. Some of the long straw is laid in the bottom of the wagon-box, and the mixed mass is thrown upon it, layer after layer alternately with straw, until the top of the wagon-

box is reached. It is most convenient to have a rack, or flaring side-boards, to confine the upper part of the load, but this is not necessary if the loading is properly done. The manner of loading the top is as follows: a bundle of straw is spread so that half of it projects over the side or end of the load. A quantity of the mixed stuff is forked on to the straw, the loose projecting ends of which are turned back on to the load when more is laid upon it. The doubled straw holds the loose stuff together, which might else be shaken off the load

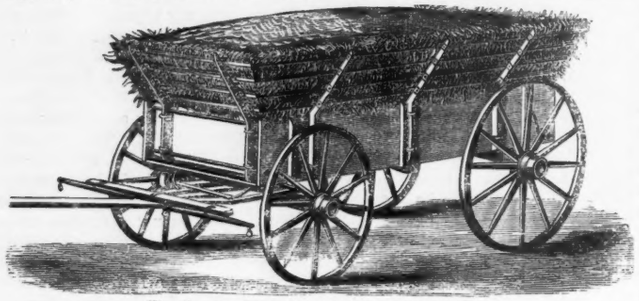


Fig. 1.—MANNER OF LOADING NIGHT-SOIL.

as it is carried home. In this manner the load is built up until it is completed, when it appears as shown in figure 1. Loads thus made are carried many miles without losing anything on the journey, and the mass, which would seem to have no coherence, is kept solidly together. Carts are sometimes loaded to a hight of two or three feet above

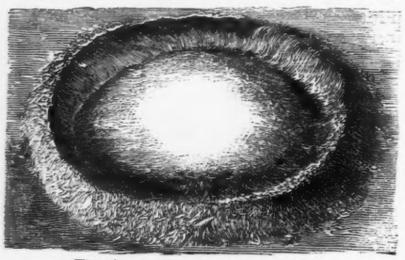


Fig. 2.—PREPARING NIGHT-SOIL.

the side-boards, and are made to carry a load for three horses. By this management this material is no more disagreeable than ordinary manure, and the work of moving it is rendered quite easy.

Spiked Feet for Ladders.

In making the feet for ladders so that they can not slip, it is well to avoid another danger, viz., that of the feet entering the soft ground unequally, and causing the ladder to be overthrown in consequence When the feet are simply pointed, this accident may easily happen in a plowed orchard, or in the soft ground around buildings. But if a sharpened pin is fixed in the square foot, as shown in the accompanying engraving, the ladder is not only prevented from slipping upon hard ground or a smooth floor, but it can not be forced into soft ground further than the square foot, and there is therefore no danger of its being overset in consequence of one foot penetrating the soil more than the other. The hole to receive the pin should be bored with an auger, and the pin should have the end that is inserted in the hole perfectly square and level, so that it can not be forced further into the wood than is intended. If it is screwed into the wood, so much the better; this may be done by hammering the pointed end of the pin square so that it may be taken hold of with a wrench and turned.

FEET OF LADDER.

How Axes are Made.

A great deal of skill is needed to make a good ax, and only the best smiths work at this business. Formerly the work was all done by hand, and was therefore done slowly. Now hammers worked by steam, which make two hundred or more strokes in a minute, are used, and to make and finish an ax, requires but a very short time. The work is divided into three distinct portions, and a different set of men is employed at each. Thus, one man, or set of men, cut long bars of iron into exact lengths, by means of a shearing machine, which works in the same manner as a pair of scissors might be made to do. These lengths, which are all exactly alike for the same size of ax, are called "molds." Others cut a bar of steel into short pieces, exactly as long as the pieces of iron are wide. A piece of steel and a piece of iron are then heated, and the steel is welded on to the iron, just at the middle, as is shown at figure 1. The piece of steel is to form the poll of the ax. The joined piece is again heated, and the ends of the iron are worked under the hammer until they are made quite thin, as seen at figure 2. These thinned pieces are taken by other men, heated, and bent around an oval-shaped mandrel, so as to bring them to the form seen at figure 3. The mandrel tapers a little, so that one end of the hole is larger than the other end. But while the iron is hot the mandrel is changed, and put into the hole the other way, and the iron is hammered over it. The hole is thus made larger at both ends than in the middle, and the purpose of this is, that when the handle is fitted on the ax, and a wedge is driven into the end of the handle, the wood is spread, and fits the larger part of the hole tightly, and the ax can not fly off from the handle; neither can it slip down towards the lower end of the handle, if it is properly fitted to it. A thin piece of steel is then placed between the thinned parts of the iron, and the whole are heated and welded together by hammering or pressing in properly shaped dies. There is then a rough shaped ax, which needs very careful working, lest it should be spoiled. This last working, which is to bring it into its final shape, is done in what is known as a hollow fire. This is a fire which is covered all over except one small hole at one side, with a crust of coal, see figure 5, and it is built up very carefully of fine soft coal, which is frequently wetted, until it is all closed in. The work heated in a fire of this kind, is exposed all over to a very intense heat, so that it can be equally worked, and it is kept from the air, which would injure it. The rough ax heated in this fire is then hammered very skillfully, to spread out the blade and make it flat and thin at the edge. The edge is pared to a proper shape by a cutting machine, and is finished with a round-faced hammer, called a "top-faller." The parings are not thrown away, but are carefully saved to be sold to the gun-smiths to make gun barrels. The ax is then tempered, both on the poll and the blade, ground upon a large revolving grindstone, and polished upon a wooden wheel covered with leather, known as a "bob," and which is sprinkled with emery powder. Most of the ax factories now have emery wheels, upon which this work is done, in place of the old-fashioned "bobs." Some axes are ground and polished bright all over; others are blackened in part; these are only ground upon the bright portions; the black parts are left rough and covered with Japan varnish. If the axes are to be sold with handles, these are fitted in; if not, each one is wrapped in paper, and a dozen is packed in a strong box. The axes are made of different weights, from 3 pounds up to 6 pounds; some are made with double bits, but the method of making them is the same in all, excepting that double bitted axes have no "polls."

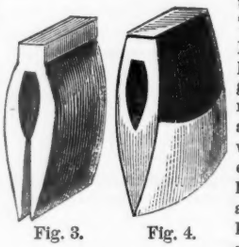


Fig. 3. Fig. 4.

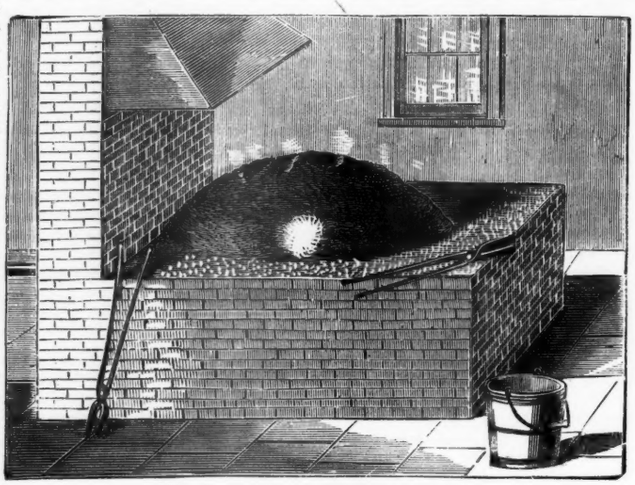


Fig. 5.—FIRE FOR FINISHING THE AX.

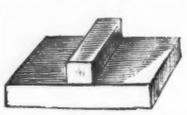
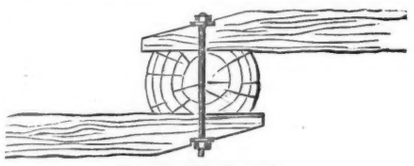


Fig. 1.

Fig. 2.—THE AX BEFORE BENDING.

A Bolted Fence.

The fence here described and illustrated, is put together with bolts. The posts are set in the usual manner, and are flattened to about 6 inches in thickness where the rails are fastened. The rails are flattened at each end to about two inches in thickness, so that a bolt 12 inches long, or a little less, will be required. If sawed rails are used, they should be an inch and a quarter thick, and the posts, if sawed, will be six inches square, so that in this case a 9-inch bolt will be long enough. Each alternate panel of the fence is fastened to the opposite side of the posts; thus, if one panel is on the inside of the fence, the next on either side of it is on the outside. In building the fence, the rails



BOLTED FENCE BARS.

are bored at one end; the posts are then bored, and the other end of the rail is bored to fit the hole in the post. This fence is easily and rapidly built, and one man can build it without help, as one end

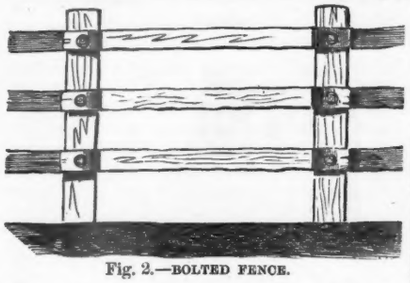


Fig. 2.—BOLTED FENCE.

of the rails can be fixed to the post while the other rests upon the ground, and when the fence is all up the nuts may be screwed up tightly. Washers should be used between each head and nut and the rails, and if some paint is used around them the fence will be all the more durable.

Poultry-Houses and Roosts.

To keep several kinds of poultry in one building, but in different yards, is sometimes troublesome

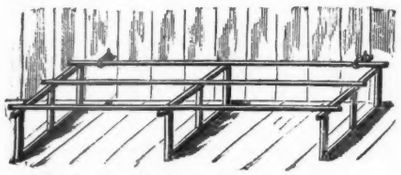


Fig. 1.—LOW ROOSTS FOR HEAVY FOWLS.

to the inexperienced fancier. It is necessary to be done, however, if each variety is to be kept pure. A method of arranging a poultry house for four varieties, is shown in figure 3. There is a square yard, divided into four parts by cross fences, and a house in the center, also divided into four apartments. The division and outer fences should be sufficiently high to prevent the birds from flying over them, pointed pickets nine feet high, would be required for the lighter varieties; six feet would be amply high for the heavier kinds, as the Asiatic fowls or Plymouth Rocks. Doors and windows are made in each apartment, as may be desirable. A passage way is made from the front gate of the yard, which leads to a central room, as shown in figure 2. Around this central room are the nests, which are reached by small doors opening into

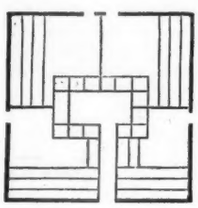


Fig. 2.—PLAN.

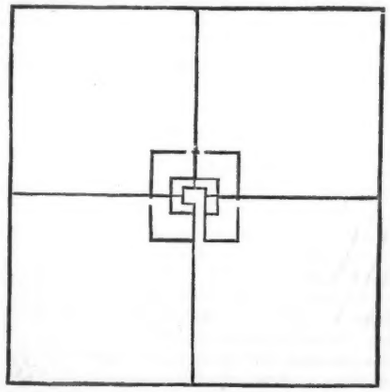


Fig. 3.—PLAN OF HOUSE AND YARDS.

them. Roosts are put up in each apartment as shown. For the large fowls, low roosts should be used, as they cannot reach high ones without a ladder, and in dropping from them are very apt to injure themselves. A roosting frame, which we have recently made for some Light Brahmas, is shown at figure 1. It is made of chestnut strips two inches square, with the edges of the upper part rounded off somewhat, to make then easy to the feet of the fowls. Three of these strips are fastened to frames made of the same material for supports. The whole is fastened to the wall by rings fixed in staples, so that it can be turned up and held against the wall by a hook. It is 12 feet long, 3 feet wide, and 16 inches from the floor. We find this to be too high for some of the heaviest of the fowls, which have to be provided with stools upon which to step up to the perches. A poultry-house suitable to keep several kinds separate, is illustrated at figure 4. Originally this was made for the accomodation of a number of dogs, and was described in the "Journal d'Agriculture Pratique," of Paris, but it is perfectly well adapted for poultry. Its peculiarly French appearance gives it a picturesqueness which, with many persons, would rather add to its attractiveness than other wise, but the style of the building may be varied to suit any circumstances. It is divided into a number of apartments, each leading into a yard, which is planted with fruit trees. The yards radiate fanwise from the building and occupy a square piece of ground. The apartments communicate with the front of the building, and a room may be there made from which each can be reached.

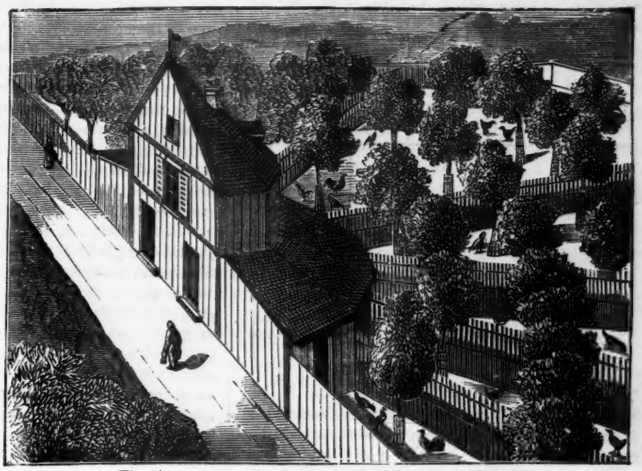
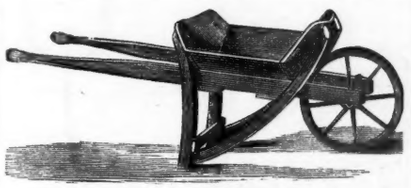


Fig. 4.—HOUSE AND YARDS FOR SEVERAL BREEDS.

A Farm Wheelbarrow.

The wheelbarrow is an indispensable vehicle on



FARM WHEELBARROW.

the farm and in the garden. Applied to hard uses it needs to be strong and durable. A barrow of the ordinary kind, used on farms, soon becomes weak in the joints and falls to pieces. The movable sides are inconvenient, and the shape necessarily adopted when movable sides are used, greatly weakens the structure. We saw a farm wheelbarrow at the Exhibition of the American Institute that was shown by the New York Plow Company of New York, who are the manufacturers, that is far superior to any others we know of, and have made an engraving of it, that its excellent points may be seen. It will be noticed at first sight that it is most strongly supported and braced, that the box, instead of weakening it, greatly strengthens it, and that it is stout and substantial. It is put together at every part by strong bolts, and can be taken apart to pack for transportation, if desired, and a broken part readily replaced. This wheelbarrow was highly commended by the judges of agricultural implements at the exhibition, which fact not only shows that it possesses, in their estimation, some novel and excellent points, but that these gentlemen, who were selected for their practical knowledge of such things, did not neglect a useful article because it happened to be an inconspicuous and humble sort of an implement.

Remodeling Old Buildings.

Frequent inquiries are made as to the improvement of old farm buildings, either by adding to them, or by remodeling them in some manner so as to make them more convenient. Many old buildings are too good to tear down, but yet are so small, inconvenient, or ill adapted to increasing wants, as to need enlarging. We have before us an inquiry which is a type of many others. "A Farmer" sends a sketch (fig. 2) of his old barn-yard and buildings around it, which he finds totally inadequate to his uses. The buildings are good of their kind, but are small, scattered, and situated without any order, and very inconveniently. At *a* is the barn, with a drive-way through it; at *b* is a small cow-stable for four cows; at *c* is a horse stable for two horses, with place for poultry adjoining, and an open shed, used hitherto as a pig-pen, is situated at *d*. A fence encloses a space used as a barn-yard. Room is needed for twenty cows with calves and yearlings; a bull; four horses; two loose boxes for cows and colts; a shed for implements, tools, wagons, and carts, and for the necessary number of pigs and poultry. To meet these requirements we suggest the following alterations, as shown in the plan seen at figure 3. None of the buildings are removed. If the foundations are not satisfactory, as is probably the case, the buildings are raised and solidly underpinned with stone, brick, or concrete; and the floors either laid with stone or concrete, or with plank, beneath which space is left open, so that vermin cannot hide and harbor. The barn is changed within, so that a cross passage is made on the main floor, at *a*, *a*, in the plan. Upon each side of the barn is a cow shed, *b*, *b*, holding 10 cows. An ample feeding

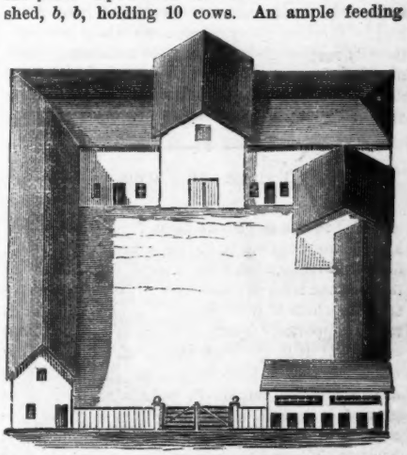


Fig. 1.—VIEW OF FARM-BUILDINGS.

floor is made at *c*, *c*, to which the cross passage in the barn leads. One of the apartments of the barn floor—it is immaterial which of them—is occupied

as a feed-room. In front of the feeding floor are pens for calves, *d*, *d*, *d*; a shed for yearlings is made out of the old cow-shed, at *e*, in which the young animals may be tied with chains, and taught something of the discipline to which they will be subjected hereafter. At *f* is an open shed for the yearlings; at *g* is the pen for pigs; at *h* is the horse-stable for four horses, with a harness-room at the

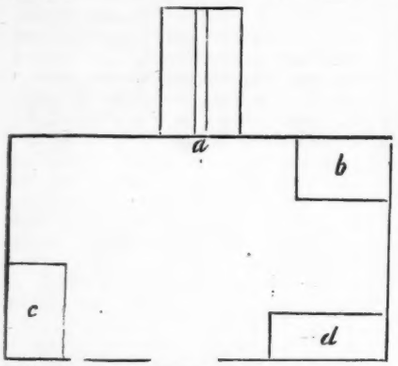


Fig. 2.—PLAN OF BUILDINGS AS AT PRESENT.

end; at *i*, *i*, are two loose boxes for in-coming cows, or mares and colts, and at *j* is a stall for a bull. In front of the calf pens are two sheds for implements, wagons, etc. The barn-yard is in the center, and a wide gateway is placed in the front of it. Paving cobble-stones will keep the yard dry and clean, and no manure should be piled in it. There are doors opening out of some of the buildings, by which manure may be carted away, to be piled or spread. An isometrical plan, showing the elevation of the buildings, is given at figure 1. The plan may be modified to suit either the kind of buildings existing, or the necessities of any peculiar case, and while it is applicable to this particular farm, as far

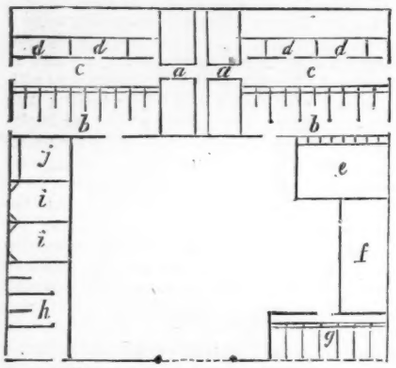


Fig. 3.—PLAN FOR REMODELING.

as possible, it is intended to be suggestive of what may be done in many other cases which are continually occurring. Before any old buildings, which may be sound, or good enough for repair, are torn down to be replaced with others, it will be well to study all practicable methods of remodeling them.

Division of Farms.

One of the wastes of the farm, from which much loss results, consists in having a number of small fields. No field, even upon a small farm, ought to be less than ten acres in extent. It is not necessary that the whole of this should be in one crop, for it may be apportioned into as many as may be found desirable. It is not only the ground occupied by the fences that is lost, but the margin of the field near the fence cannot be cultivated, and more ground is wasted there. The loss is greatly increased when the fences are crooked, and when weeds are allowed to grow up about them. In such cases it is well worth while to remove all the inner fences of the farm, and remodel the whole arrangement of them. The outer fence should be made perfectly safe and substantial, and if there is a pasture, a safe fence should be made between this and the plowed ground. The latter needs no division by fences, simple furrows or lines are quite sufficient to divide one plot or crop from another; then all the ground is used and none wasted. If at any time one of these plots is to be pastured, or stock is to be turned into it, a temporary fence should be used. Many kinds of temporary and portable fences have been described and illustrated from time to time in the *American Agriculturist*, any one of which would be found useful for this purpose. The saving of ground by removing useless fences is very important. The smaller the fields, of course the greater the saving in proportion. For instance, a common worm-fence around a square field of three acres, occupies 8,280 square feet—about one-fifth of an acre—or about 7 per cent of the space enclosed. A similar fence around twelve acres, being four times the space, occupies only double the room; a saving of 50 per cent in the ground occupied. If the space enclosed is 48 acres, the ground occupied by the fence is only four times that required for 3 acres, while the area of the ground is increased *sixteen* times. This explains the great waste occasioned by fencing a number of small fields, and the saving pointed out in having only a few, or one large field. Division fences are an enormous tax upon farmers, the cost of maintaining them, and the loss of ground occupied by them, and of the yearly produce which might otherwise be taken from this ground, is even more than the original cost. It is time something should be done to avoid this waste, and there is no better season for moving fences than the present one.

Poke for Breachy Animals.

The natural sagacity of a breachy animal will often enable it to overcome any ordinary restraint we may put upon it, and it becomes a strife between it and its owner, as to which is the most fertile in expedients. If we watch the efforts of a breachy animal to avoid the means used to keep it within bounds, they will go far to induce us to believe that it possesses powers of reasoning. It is necessary, therefore, that pokes, hobbles, or other devices for restraint, should be perfectly effective, and not such as may be circumvented by the animal, lest it learn new tricks and become worse than ever. Most of the pokes in use are either in the way when the animal is grazing, or if not dangerous, ineffective. One that seems to be all that can be desired in the way of a poke is here illustrated. It is made of horse-shoe bar-iron, and is provided at one end with arms and rings by which it is fastened to the animal's head, and at the other end with a hook. The poke is curved forwards so that when the animal approaches a fence, the end of the hook becomes entangled with the lower rail, and holds fast to it. When the animal is grazing, the curved form of the bar causes it to slip forward and remain out of the way. The hook should not be sharp, but simply a portion of the bar turned up but not pointed.

POKE.

CARRIER PIGEONS ON THE POLICE FORCE.—Mr. W. B. Tegetmeier, the well known poultry fancier and writer on matters relating to domestic birds, describes a new use to which carrier pigeons have been put in England. Their instinctive habits have there been made available for the assistance of the police in carrying messages from out-stations to the central office, or to the stations from any locality to which detectives have been dispatched. The utility of pigeons in this respect may be turned to good account when there is no telegraph station at hand, as a message may be conveyed to headquarters from some miles distance in a few minutes. It is not at all improbable that we may see this idea put in practice for detective purposes, and for conveying messages, in this country.

Tim Bunker on the Evils of Agricultural Fairs.

MR. EDITOR: Things are getting awfully mixed up here in Hookertown, and half of the time I can hardly tell whether I am in the "land of steady habits" or not. The last County Fair in Hookertown was not in good old style at all, if I am any judge. Joseph's coat of many colors was a very poor thing in comparison with the variety show they had up here. You see things have been getting worse and worse for several years.—After we cleaned out Col. Lawson who got up "the gal hoss race" just afore the war, we had decent times for several years.—That picture in the paper of the "set-to" between the "gals" with the ribbins and calico flying did the business for the Colonel and his style of Agricultural Fairs. He fell flat as a pancake, and Deacon Smith was put in President of the Society, and cattle, sheep, poultry, fruits and vegetables had a fair chance for several years. The fairs were well attended by farmers and their families, the Society got out of debt, and got money ahead to buy land and buildings for a permanent home. Several thousand dollars were distributed in premiums every year, and the horses did not get more than their share of attention. It was flush times after the war—money was plenty, and Seth Twiggs said the noses of people in Hookertown were getting elevated. Colonel Lawson came home from the war a Brigadier General, run for Congress, got elected for one term, and was elected to stay at home next time. The General grew uneasy, and by the aid of the livery stables and grog shops got in President of the County Agricultural Society once more. We were going to have several reforms introduced. There were to be greater attractions at the fairs—greater multitudes were to come out, the finances were to be improved, the grounds enlarged, and new buildings were to be put up for the accommodation of animals, so that the finest stock in the County would come to the fair. The new attractions centered the first year in a balloon ascension which emptied every grog-shop in Hookertown, left Smithtown with nothing but cripples and babies to keep house, and depopulated the White Oaks, so that there was not a dog left on the street. There was a big crowd, and a good deal of money taken at the gates, but a good many of the farmers could not see exactly "how a balloon raisin' was gwine to help farming." They were ready enough to admit that the machine was a big thing, the gas wonderful, and the fellow smart that went up like Elijah into the clouds, but the puzzle was to know what that had to do with farming. The next year the General wanted the track worked so that it should be as smooth as a house floor. The cattle would appear so much better as they passed round before the judges. The track was enlarged, thoroughly worked, and the judges saw the grand cavalcade. The next year the premiums offered on horse-flesh were greatly increased, and a little trotting was allowed against time. The competition was confined to horses raised in the County, and no outsiders were invited. Side shows began to come in—bearded women, dwarfs, hair-seals, devil-fish—monstrosities and peddlers of various wares. Every year the fair ran more and more to horse-flesh. The premiums for trials of speed were greatly enlarged. Outsiders came in with their fast nags. The General's style of Agricultural Fair culminated this year in a regular race course, with all its attendant evils of drunkenness, gambling, and fighting. About all the loose cash in the White Oaks was staked upon Kier Frink's stallion, a broken down race-horse, that has run in his coal cart for the last five years. He was fast once, faster than anything the White Oakers had ever seen. Shadtown smelt the battle afar off, and sent up its sample of five-year-olds, that had never run a race before. Hookertown livery stable had kept several horses in training several months for the various races that were put upon the programme.

It was kept in the dark that the Smithtown clique, with the General at its head, had the horses engaged from abroad that were to win all the large premiums, running from one to five hundred dollars. Pretty much every town in the County was represented on the track. The General and his managers having made a sure thing of getting the best horses into the Smithtown ring, could bet as heavily as they liked against the green horses that came in from the country. Everything was done for the benefit of the gambling fraternity. The privilege of pool selling was sold for the benefit of the Society for the sum of $400, and a pool-wheel was run during the four days of the fair, so that every one might have a chance to put up his money. Then under the guise of encouraging the production of "Native Wine," and suppressing the evils of intemperance, a grog-shop was opened on the grounds, where all kinds of intoxicating drinks were sold out of bottles labeled "Concord Wine," "Catawba Wine," etc. Everybody in Hookertown knows that there is not a vineyard in the County, and that there are not half grapes enough raised to supply the table. "You might search every cellar in Hookertown," Seth Twiggs says, "and barring a bottle or two of Elderberry or Currant wine kept jest for sickness, you could not find any thing they called wine."—It answered the purpose of the gamblers just as well as if grape juice had been plenty in Hookertown. The "Native Wines" were well patronized, the people were made wise and rich, and were ready to bet on their own horses without dreaming of a ring in Smithtown. The great races were run at the fair in October, and the White Oaks and Hookertown had an eye opener. Kier Frink not only lost his money, but his horse, for he was so sure of winning that he bet horse and all on the race. Jake Frink found out "that that 'ere wheel didn't turn but one way, and that was always towards Smithtown. Yer don't ketch me agin." George Washington Tucker and Benjamin Franklin Jones and their cronies at the livery stable used language that Parson Spooner would not approve of. Shadtown felt cheated, wouldn't stand it any way, attacked the Smithtown ring on their way home, and got soundly thrashed.

It seems to me, Mr. Editor, that our State and County Agricultural Societies need a good deal more attention from farmers than they get. Too often they are run by men of the General Lawson sort, who are not farmers, and who only want to use the fairs for their own benefit. The horse is of chief benefit to them as a means of gambling, which means cheating and robbery. The track grows more prominent every year, and cattle, sheep, swine, poultry, fruits, and vegetables, are crowded into the back-ground. In some of the societies the Annual Show is mainly a horse-race, with its attendant evils, betting, high excitement, drunkenness, and quarreling. Men of good morals and quiet habits withdraw in disgust. It is no place for them and their families. These growing evils of our Agricultural Fairs should have attention at the annual meetings to be held this winter, and be remedied.

Hookertown, Ct., Nov. 10th, 1876. Yours to command, TIMOTHY BUNKER, Esq.

Clearing Land by Blasting.

Sometime ago we gave an account of the use of dynamite or giant powder, in removing stumps and rocks from recently cleared wood-land, or old meadows, with some illustrations of the methods employed. The large number of enquiries for further information, we have received since then, made it advisable to experiment with this explosive in a practical manner, in order to thoroughly test its value. This we have recently done, in conjunction with the officers of the Atlantic Giant Powder Co., the manufacturers of the explosive. The ground selected was on the estate of J. Hull Browning, Esq., of Tenafly, N. J., who kindly gave the requisite facilities. The work was done by Mr. I. J. Werden, of Pittsfield, Mass., who of late has made a business of clearing land in this manner, and has operated on many stumps and boulders.

The explosive used is dynamite, or giant powder. It is a mixture of nitro-glycerine with some absorbents, by which this dangerously explosive liquid is made into a perfectly safe solid substance, of a consistence and appearance not unlike light-brown sugar. It is not possible to explode dynamite by ordinary accident, nor even by the application of a lighted match. A quantity of it placed upon a stump and fired with a lighted match, burned away very much as a piece of camphor or resin would do, with little flame but much smoke, and boiled and bubbled until only a crust was left. There is not the least danger, therefore, of igniting the powder dangerously, until properly placed for the blast. In this respect it has a very great advantage over ordinary blasting powder, which may be exploded by a spark. The powder, as it is manufactured, is made into cartridges about eight inches in length, and of any required diameter. Those used in this operation were 8 inches in length, but these may be cut into pieces with a knife, as may be required for use. The cartridges are wrapped in strong parchment paper, covered with paraffine, and the true form is shown at figure 1. They are fired by a cap, (also in figure 1), which is inserted into the end of the cartridge. The fuse, which is of the common kind, is inserted into the open end of the cap, which is pinched close upon it with a small pair of pliers, so as to hold it firmly. The cartridge is then opened at one end, the cap with the fuse attached inserted, and the paper is tied tightly around the fuse with a piece of twine. The cartridge ready for firing is shown at figure 2.

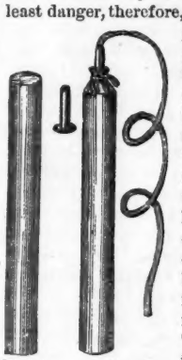


Fig. 1. Fig. 2.

The first operation was upon a green white oak stump, 30 inches in diameter, with roots deeply bedded in the ground. To have cut and dug out this stump, with ax and spades, would have been a hard day's work for two or more good men. The shape of the stump is shown at figure 3. A hole was punched beneath the stump, as shown in the figure, with an iron bar, (fig. 4), so as to reach the center of it. Two of the cartridges were placed beneath the stump, and were tamped with some earth; a pail of water was then poured into the hole, which had the effect of consolidating the earth around the charge. The fuse was then fired. The result was to split the stump into numerous fragments, and to throw it entirely out of the ground, leaving only a few shreds of roots loose in the soil. The result is shown in figure 5, on the next page; the fragments of the stump in the engraving were thrown to a distance of 30 to 50 feet, and many smaller ones were carried over 100 feet. The quantity of powder used was less than two pounds. A portion of the useful effect produced by the explosion, consisted in the tearing of the

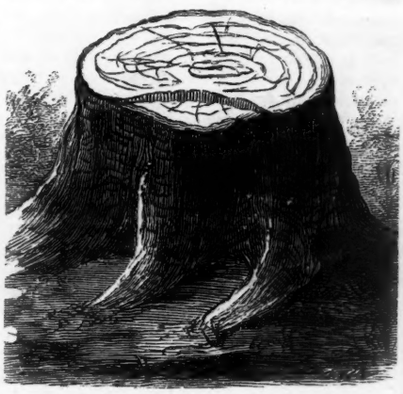


Fig. 3.—THE STUMP BEFORE THE EXPLOSION.

stump into such pieces as could easily be sawed up into firewood; by which much after labor in breaking it up, when taking it out in the usual manner, was saved. This test was perfectly successful, and proved not only the thorough effectiveness of the new method, but its economy in cost and in time. Several other stumps were taken out in the same manner; the time occupied with each being from five to ten minutes. Smaller stumps were thrown out with single cartridges, and in not one case was anything left in the ground that might not be turned out with the plow, or that would interfere with the plowing of the ground. The explosive was then tried upon a fast rock, of about 150 cubic feet, weighing about 10 tons. The shape of the rock before the explosion is shown at figure 6. A hole was made, with the bar, in the ground beneath the rock, and three cartridges were inserted and exploded. To have produced this result (shown at figure 7, on page 20) by the ordinary method, that was here done in a few minutes by one man, would have occupied at least two men with drills, sledge, etc., two or three days. The application of this method is seen to be of great value where the saving of time is an object. An acre of stumps or rocks may be cleared in one day by one or two men, and the material left ready for use as firewood, or as stone for fences or buildings. The cost in money is also reduced in some cases very considerably, and almost absolute safety to the careful operator is ensured. It would be generally advisable to secure the services of an expert, and that the parties who have work of this character to be performed, should jointly engage such a man who could either do the whole work, or to do it in part, and instruct a foreman or skillful workman sufficiently in a day to perform the remainder. The most favorable seasons for operating upon stumps and rocks are fall and spring, when the ground is saturated with water. It should be explained that this explosive is not injured by water, although a long continued exposure to it would affect some qualities of it.

Fig. 4

Fig. 6.—THE ROCK AS IT WAS.

The Prickly Comfrey.

Nearly two years ago we received from England a circular concerning the Prickly Comfrey, which made most extraordinary claims as to its value as a forage plant, accompanied by equally extraordinary engravings. Having seen so many of these wonderful plants "go up like a rocket" at the expense of credulous cultivators, and then "come down like a stick" to the great disgust of the cultivators aforesaid, instead of putting the matter before our readers, as we were requested to do, and run the risk of disappointing many of them, we preferred to quietly procure the plant and make ourselves somewhat acquainted with it, before saying anything about it. The drouth of last summer quite interfered with our plans. Our experimental garden has a very light sandy soil, which in most seasons is preferable for our purposes to a stiff heavy one, but in the exceptional summer just past all the plants suffered heavily, and it is nothing against the Prickly Comfrey that it succumbered under conditions which native trees, for several years establish-

ed, could not survive. One reason for cultivating the plant was that we might have materials from which to make a drawing, as we were sure that the engraving above referred to could not be accurate. While we were working up the matter, by a singular coincidence our associate, Col. Waring, was, unknown to us, experimenting with the same plant, and in his Ogden Farm Paper intended for December, surprised us by "stealing our thunder." What he said about the Comfrey was withheld until an engraving should be ready, and with a description appear with his account of its uses. Knowing that our friend, Thomas Meehan, had the plant at his most comprehensive nursery at Germantown, Pa., we obtained a specimen from him, and with the aid of this and an accurate colored plate just received from England, the engraving here given was made. The botanical name of the plant is *Symphytum asperrimum*, which readily translates into very rough, or "Prickly Comfrey." *Symphytum* is from a Greek word meaning *to grow together*, as the common garden Comfrey had formerly a reputation for healing qualities, a notion which the common name Comfrey also conveys, that being from the Latin *confirmo*, to strengthen. We may add that the root has no marked properties, being simply mucilaginous and slightly astringent, and like many other plants formerly of high repute, owed its reputation chiefly to its harmless qualities; these did not prevent a recovery which was, of course, attributed to the medicine, while it took place in spite of it. The Prickly Comfrey is a native of the Caucasian mountains, where it grows at altitudes varying from 1,800 to 6,000 feet. It is a perennial, with a very large thick and branching root. It produces a large cluster of long petioled leaves, which are 18 inches long, the petiole, or leaf-stalk, being 12 inches long; the lower part of the blade of the leaf is either rounded or wedge-shaped, and on its lower surface, on the mid-rib and veins, are roughish bristly hairs, which suggested the specific name; the leaves, when young, are often quite woolly and hairy. The flower-stalk has its upper leaves sessile, or without any leaf-stalk, and flowers, somewhat smaller than in the garden Comfrey, of a blueish purple. The plant is readily multiplied by division, taking care to secure a bud with each portion of root, or it may be propagated from cuttings of the roots. Col. Waring (see "Ogden Farm Papers") cautiously states the claims made for this plant abroad, and gives some points from his own experience. Since his article came to hand, we have had some correspondence with Mr. C. E. Ashburner, Edinglassie, Richmond, Va., who, after many experiments to find a fodder-plant suited to the country, thinks that he has found in this Comfrey "something worth having." He writes: "I do not find its virtues very much exaggerated in the published accounts; on the contrary, I am sure that the yield the first year, which is put down at 20 tons, is considerably understated." The following detached sentences from several letters are in response to our questions, the nature of which will be implied by these answers: "It may be cut six times a year, at least. I have cut some plants eight times the first year, and grazed them with cows and horses besides."...."It is perfectly easy to cut the plants with a sickle, or any other kind of a cutting knife."...."The leaves of the *Symphytum* can be stacked green (or partially dried), with a little salt between the layers, and will keep well through the winter."...."I have not tried to raise any plants from the seed, as I have invariably cut the stems as soon as they showed any signs of flowers; the leaves grow much more vigorously if you do so."...."The plants do not grow to their largest size until the second year."....He further adds: "There have been several severe frosts lately (Nov. 16th), but in no instance has the smallest damage been done to my plants, old or young. I have many thousands now just out of the ground, but so far frost has not touched them. I am still feeding my cows, horses, and pigs, on the Comfrey, which is growing every day. * * * I am so well satisfied with the plant that I am planting largely, and am quite sure that it cannot fail to come into general use in the Southern States, where fodder is scarce."—We may add to this interesting home testimony, that of M. J. A. Barral, one of the most prominent agricultural writers of France, and Secretary of the Central Society of Agriculture. In the Journal of that Society for Oct. last, he states as his experience with the Caucasian Prickly Comfrey: "The animals thrive well upon it, and that in the green state it contains 4 per cent of nitrogen and is equal in richness to green maize. The total of nitrogenous substances is about one-

PRICKLY COMFREY.—(*Symphytum asperrimum.*)

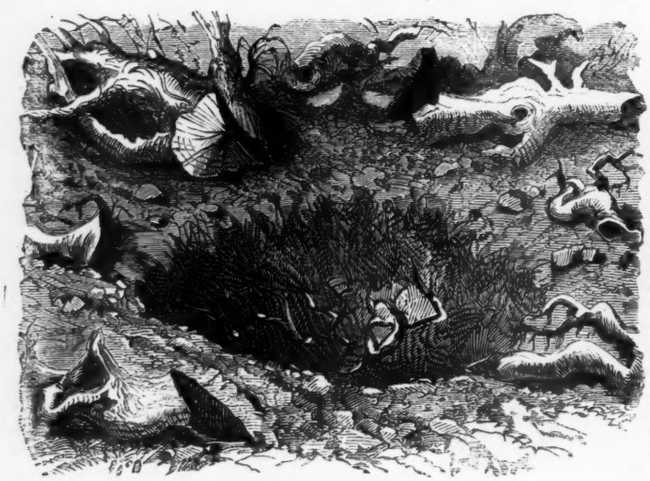


Fig. 5.—THE EFFECT OF BLASTING THE STUMP.—(*See page* 19.)

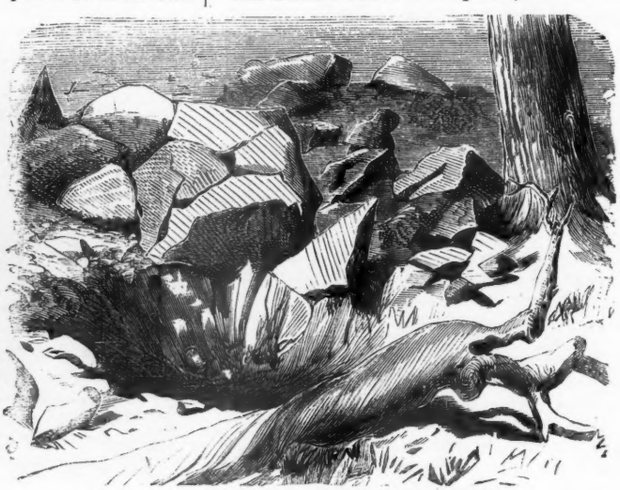


Fig. 7.—THE ROCK AFTER BLASTING.—(*See page* 19.)

third, [meaning, no doubt, one-third of the nutritious constituents, and not one-third of the whole—ED.], and which justifies the high opinion that cultivators who have tried it have formed of the plant." Looking upon this testimony from disinterested parties, we are warranted in presenting the Prickly Comfrey to our readers as a plant well worth trying, and we may add that neither this nor any other plant will produce a large yield of nutritious forage from impoverished land or under neglect. "Out of nothing, nothing comes," is a proverb that finds an application in agriculture, as well as in other human affairs.

THE APIOS OR GROUND-NUT.

THE RACEMOSE FUCHSIA.—(*See next page.*)

The Apios or Ground-Nut.

For a long time this plant has been on a memorandum of the subjects to be presented to our readers, and now that Prof. Gray explains the remarkable mechanism of its flowers, it seems appropriate that we should say a word about the plant itself. The plant, *Apios tuberosa*, has a wide range—from Canada to Florida, and from the Atlantic Coast to the Rocky Mountains. Below ground it produces numerous small tubers, which are strung at intervals, like beads, on a slender underground stem. The stems grow from four to twelve feet long, twine over other plants, and bear at short intervals compound leaves, consisting of two or three pairs of leaflets, and an odd one, that is, they have from five to seven leaflets, which distinguishes it from all others of the proper Bean Tribe, which ordinarily have but three. Both stem and leaves are usually smooth, when old, but in the far West are more or less downy. The flower-clusters appear in August in the axils of the leaves, on stalks an inch or two long, and the clusters themselves are about the same length, much crowded and sometimes branched. The individual flowers have their curious structure so well described and illustrated in Prof. Gray's article, that it would be superfluous to add anything upon this point. The flowers, while not showy, are interesting on account of their form, and their unusual color, which is a chocolate purple, with some tinges of green and flesh-color. What they lack in beauty of color, is made up in fragrance, for there are few of our wild flowers so delightfully scented, their perfume recalling, though not precisely like, that of the European or Sweet Violet. The pod is three to five inches long, curved, and containing numerous dark purple seeds. The engraving, which shows a portion of the stem, is much reduced. This is one of the wild plants that is well worth cultivating, and while it is commended in most European works upon flower culture, it is scarcely known to our gardens, though its merits did not escape the observation of the excellent late Mr. Breck, who mentions it in his useful "New Book of Flowers." It is a plant that may be made useful in many situations, and if one has a corner for a wild garden, it may be introduced there, and allowed to ramble. Not the least of its merits is its late flowering, coming into bloom at a time when flowers, and especially fragrant ones, are scarce, it needs only to be known to become popular. European florists offer the tubers, but we doubt if they are to be found on sale in this country. Fortunately the plant is not rare, and those who meet with it in their walks, should mark the place, and dig up the tubers when they have matured. The tubers afford the most ready means for the propagation of the plant, and may be kept out of the ground for some months without detriment, if not allowed to become too dry. The tubers, often numerous, are seldom over an inch in diameter. Our engraving is drawn from a dried specimen in the herbarium; while looking through our library for some illustration that might assist the artist in making his drawing, we came across the first representation ever made of the plant, in the "History of Canada Plants," by Jacob Cornuti, Paris, 1635. This quaint old copperplate shows the plant, filling a whole page, and elaborately trained to a trellis, with strings of tubers running to the right and left across the page, in great profusion. These tubers are said to be pleasant to the taste when cooked, and they afforded a portion of the food of the Indians, who, according to Kalm, called them "Hopniss." When the potato-rot threatened to cause the potato to be abandoned, the tubers of this plant were among the many substitutes proposed, and were introduced as the "Dakota Potato," its real name being kept secret. No doubt, some of the speculators of that day turned the matter to good account; but as an esculent it proved a failure. Those who have the *American Agriculturist* for twenty years or more back, will find various reports of the want of success of those who tried it, some claimed that in culti-

vation the plant produced smaller tubers than it did when wild. Some writers describe them as growing to the "size of an egg;" if a hen's egg is intended, we must say that, though we have dug up a good many, we never saw one larger than, if so large as, a pigeon's egg.

The name "Ground-nut" is an unfortunate one, as there is nothing nut-like about the plant. The botanical name, *Apios*, from the Greek word for *pear*, referring to the somewhat pear-shaped tubers, is a pleasant-sounding one, and easy to recollect, and it is in every respect preferable to "Ground-nut," which is often applied to pea-nut, as well as to some other plants. The early botanists placed this and the Wistaria in the genus *Glycine*, which is now restricted to a few tropical bean-like plants. There are two other species of *Apios* besides *A. tuberosa*, one growing in China, and the other, which is said to have handsome red flowers, in the Himalaya mountains.

The Racemose Fuchsia.

The varieties of Fuchsia are very numerous, and each year adds its novelties to the list. While a few of those in cultivation preserve the original form of the species, the majority, and those among the most beautiful, are produced by hydridizing and crossing. There has been such a commingling of blood, as breeders say, that it is impossible to trace some of our most prized varieties to their parent species. While we admire these productions of the florist's skill, we also like to see the unaltered species in cultivation, and are glad that another —*Fuchsia racemosa*—has been recently added to our collections. This species is far from being a new one, as it was described nearly a hundred years ago, but if it ever was in cultivation, it has long been lost, and now has all the interest of a new discovery. The plant has a spreading habit, throwing up numerous suckers from the root, and thus forming large clumps, from one to two feet high. The engraving of the upper portion of a stem gives the form of the leaves and flowers of the natural size. The flowers, which are clustered at the top of the stem in a raceme, are very narrow in proportion to their length; the petals, which in most other species are so conspicuous, are in this very nearly of the same size with the divisions of the calyx, and both are very nearly of the same color, which is a very bright scarlet, and exceedingly showy. The plant was collected several years ago by Thomas Hogg, Esq., in the mountains of St. Domingo, where Father Plumier originally discovered it nearly two centuries before, and described it in 1703, it being the first Fuchsia ever described, and the one upon which the genus was founded. It was exhibited at one of the exhibitions of the New York Horticultural Society, where it was examined with much interest by the florists present, who looked upon it as a novelty of great promise. The stock of the plant passed into the hands of Mr. Peter Henderson, who will no doubt offer it for sale in due time. Coming from the high mountains of San Domingo, it may prove much better suited to bedding purposes, and endure our hot summers much better than those which are descended from natives of the warm and moist forests of Mexico and South America. We have not had an opportunity to carefully examine this plant in bloom, but have no doubt that Mr. Hogg has manifested his usual accuracy in referring it to *Fuchsia racemosa* of Lamarck.

How Flowers are Fertilized.

BY PROF. ASA GRAY.

ARTICLE IX.—GROUND-NUT OR APIOS.

Our long story about Beans and their relatives was not quite finished in the October number. There is a wild Bean worth noticing for the curious difference between its arrangement for fertilization, and that of the common Bean-flower. I hardly know which is the more curious; but the one now to be described has the greater novelty. Indeed, I had the pleasure of finding it out only a year ago last summer. The plant in question abounds in low grounds, especially along streams, and climbs by twining up the stems of herbs and over bushes, and is described by the Editors on another page.

It is with the flowers only that we have now to do. They are like those of Beans in form and arrangement, with a little difference. The wing-petals stand forward, and make the same kind of landing place. But the weight of a bee or other insect alighting on them has no such effect as upon the Bean-flower, indeed does not alter the position of the stamens and pistil at all. The part of the flowers which encloses these (the *keel*, so called), is curved, not into a coil, as in beans, but into the shape of a sickle or semicircle. The tip of this keel rests firmly in a small notch or indentation at the middle of the top of the *standard*, the large and hollowed petal—in shape not unlike a ladies' bonnet of the olden time, when bonnets were ample—which forms the whole back-side of the flower. The keel remains fixed in this way, if the flower is let alone, spanning across the middle of the deep cavity, which opens to the bottom of the flower. Figure 3 represents a flower-bud, cut through lengthwise, so as to show the pistil within, and some of the stamens. The way in which the end of the keel rests in the notch or pocket, is best seen in figure 4, which, on a larger scale than figure 1, represents a flower, with the part of the standard coming towards the eye, cut away, to give a clear view. The tip of the keel is not dislodged from its socket by any moderate jar, nor by pressing from the outside. But when, in any fresh flower, we raise the tip by a lift with the point of a pencil from underneath, the keel promptly curves more, and takes the shape and position shown in figure 2, at the same time splitting from the apex down the inner edge, and protruding the tip of the style, and, in a less degree, the opening and pollen-laden anthers.

Fig. 1. *Flower unvisited.*

Fig. 2. — *Flower which has been visited by a bee, and the keel sprung.*

Figure 5 represents, in outline or diagram, the change which takes place when the tip of the keel is dislodged from the socket. The dotted lines show the position of the trap—as we may call it—when set; the strong curvature shows it sprung.

How this contrivance subserves cross-fertilization, it is easy to see. I am confident that the blossoms are seldom, if ever, self-fertilized. The anthers from the first lie a little behind the stigma, which is small, and at the very tip of the naked style. Upon opening several flowers of various ages, even when the pollen lay loose in and around the bursting anthers, none was found upon the stigma. At first the stigma is covered with a pulpy secretion; at last, when the stigma developes fully, and the center is free from this pulpy matter, this forms a soft ring around its base, over or through which no pollen passes. Nor is it likely that any pollen reaches the stigma when this and the anthers protrude upon liberation from their confinement. This liberation, I am convinced, ordinarily takes place only upon the visit of a bee, or some such insect, which entering, at least partially, into the open cavity of the blossom either side of the keel, presses the latter upward from beneath. The strong tendency to further curvature of the whole keel, and especially of the pistil, which before simply pressed the tip into its socket, and so held all fast, now takes effect, and it coils in the way shown in the figures; during which the stigma, and then the anthers are likely to be brought into contact with some part of the insect's body; and so, when flower after flower is visited, cross-fertilization must needs be effected. Equally, too, when a bee visits a blossom, which has been let loose, if it enters upon the side towards which the style swerves (as it always at length, if not immediately, does, either to right or left), the stigma will first be touched, probably by a pollen-dusted portion of the insect's body, and then the anthers will give a new supply of pollen for the next blossom; and so on. To understand this well, compare the account and the figures with those of the common Bean, in the October number, and admire the wonderful contrivance, by which the same kind of flower is modified in the two cases, so as to produce the same result in two different ways. Both are equally good for cross-fertilization, receive full explanation upon that supposition, and are unintelligible without it.

Fig. 3.—*Section of flower-bud, enlarged.*

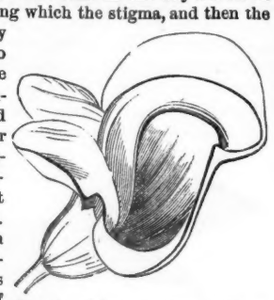


Fig. 4.—*Enlarged flower, with a part of standard cut away, showing the keel in place, and the socket in which the tip of the keel is held fast.*

I have two reasons for affirming that the flowers of Ground-nut do not self-fertilize. First, as here shown, the structure seems to forbid it. Second, growing here in the Botanic Garden, and blossoming profusely, not a pod has been seen for the last two years; and in the neighboring low grounds, where it abounds, fruit is rare. It must be otherwise in some places or some seasons, for the herbarium contains copiously fruited specimens. The blossoms are dull in color; but their delicious fragrance must appeal to the acute senses of bees. Here, in fact, as in most Orchids, the arrangement for cross-fertilization is so perfect and special, that, if not responded to, reproduction by seed fails. Now in this respect it differs from peas, clover, and the like, which can and do self-fertilize more or less, and so make sure of some seed. Even the bean-flower secures a margin for self-fertilization when it can no better be. When we depress the wing-petals, and bring out the stigma and the brush behind it, (see October number), any pollen which does not adhere to the brush is pushed forward so far that, when the style retracts, some of it reaches the stigma. In an early article upon the subject, (as far back as 1857), to which my attention has just been recalled, Mr. Darwin says that he fertilized some bean-flowers tolerably well, while protected from bees, by pressing down the wings so as to effect this movement.

Fig. 5. — *Diagram, showing same, with the keel sprung, and stigma and style protruding.*

Facts of this kind, and the setting of some seed when blossoms are covered, have been appealed to as evidence that such contrivances as we have been describing are merely something odd, perhaps unaccountable, of no material importance to the race, possibly even a disadvantage. But a little reflec-

tion may convince any clear-headed reasoner that occasional or even frequent close-fertilization is no argument against the advantage (or the ultimate need) of cross-fertilization. Cross-fertilization, we may well believe, is the best thing, but is risky. Cross-fertilization, tempered with self-fertilization —which is the commoner case—is practically the best on the whole under ordinary circumstances—is the compromise between the two risks, viz.: failure of vigorous and fertile posterity on the one hand, and failure of immediate offspring on the other. "Get money, honestly if you can, but—get money," was the advice of an unscrupulous parent. Get fertilized, cross-fertilized if you can, close-fertilized if you must—is Nature's golden rule for flowers.

"Wire-Worms," and their Work.

With insects as well as plants, common names are used very loosely, and lead to confusion. Thus "Cut-worm" is a name given to the larvæ of insects of widely different families, and the name "Wire-worm" is applied to the larvæ of insects, and to animals that are not proper insects. Not long ago a correspondent at Montreal, Canada, complained that "Wire-worms" were doing great damage to his flower-beds, and asked what could be done to destroy them. Unlike many who ask such questions, he sent specimens that enabled us to know what he was talking about. His pest was not a worm proper, nor the larva of an insect, but one of the *myriapods*, or *millipedes*, as they are called, belonging to the genus *Iulus*, of which there are several species, one of which is shown in the engraving. These have long, cylindrical, shining bodies, made up of a great number of horny, arched divisions, the most of which bear two pairs of legs; they have two short feelers at the head, are mostly of a blackish or dark brown color, and when disturbed, roll themselves up into a coil. Our species are from an inch to an inch and a half long, but there is one in South America, having a length of six or seven inches. As the books generally say that the species of *Iulus* feed upon decaying vegetable matter, and some state that they are

"WIRE-WORM."—*Iulus.*

beneficial rather than injurious, we thought the correspondent referred to must be in error as to the cause of the damage, and asked for further particulars. He replied as follows: "I planted out last spring a good-sized bed of carnations; two-thirds of them where cut down in about a fortnight, and I could trace it to nothing else than these worms, with which I found the bed to be infested. I removed the balance to another part of the garden, and saved them. I then examined some of the lily bulbs in the next bed, and found some of the living bulbs partly eaten, with the worms in them. I have destroyed large quantities this autumn, by slicing apples and turnips, and laying them on the infested beds, the worms collecting under them in masses, which were removed and burned."—Testimony so positive from an evidently intelligent and careful observer, induced us to look up the authorities at hand more carefully than before, to see if the destructive habits of the *Iulus* had been noticed by any one else. Westwood, the eminent English entomologist, says that "they feed on animal and vegetable substances in a state of decay." Smee (Eng.) is "by no means certain as to the functions" they perform, and quotes Boisduval as saying that one *Iulus* is "a friend to the gardener." Among American authors, a writer in the "American Cyclopædia," and others, including Morse, the most recent of all, say that they live on decaying matter. Packard indefinitely says, "they live on vegetable substances, or eat dead earthworms or snails." After a long hunt we came upon some light in the "Practical Entomologist," by the lamented Walsh, which, like its successor, the "American Entomologist," was too good to last. Here, in Vol. 2, p. 34, (Dec., 1866,) we find a complaint of the destruction worked by an *Iulus* in the strawberry plants, and other plants, by eating their roots. Mr. Walsh says: "So far as is recorded in such authors, as are accessible to me, and so far as my own experience extends, all other species of the *Iulus* live on decaying vegetable matter, such as rotten wood." Finding this to be a new species, Mr. W. goes on to describe it as *Iulus multistriatus*, which is the species here figured. It is 1.15 inch long, brown, with most of the joints marked with numerous minute striæ or lines. What is quite singular, Mr. Walsh suggests just the same means of destroying the "worm," as that hit upon by the Montreal correspondent, only instead of apples and turnips, he suggests carrots, potatoes, or parsnips, which, he thinks, might be laid under pieces of board. It is quite strange that recent writers should have overlooked the matter, and that Packard, while he mentions the species, omits to give its most important character, in a practical view, and to state that it is really destructive. The fact that, while most of the Lady-birds are useful in destroying other insects, one species is a most destructive vegetable feeder, finds a parallel case in the *Iulus*, and shows that it will not do to infer, because some species have habits in common, all of similar structure are like them in these respects. It must now be admitted, that at least one *Iulus* is to be regarded as an enemy, and to avoid confusion, instead of calling it a wire-worm, or what is worse, "*the* wire-worm," let it be a Millipede. The very simple remedies above mentioned seem to be fairly successful. If any better ones are discovered, we hope that our friends will inform us of them.

KILLING THE "CABBAGE WORM."—The caterpillar of the European Cabbage Butterfly, *Pieris rapæ*, is without much regard to accuracy generally called the "Cabbage Worm." Though it is but little troublesome now in the localities where it first appeared, there are still many places where it has proved very destructive the past season, even ruining whole crops, and it is likely to continue to be a source of loss to cultivators in various parts of the country. Fortunately the natural enemies of the insect, especially insect parasites, increase with great rapidity, so much so that in places where a few years ago it seemed as if cabbage culture must be abandoned, the number of the "worms" at present is not sufficient to cause any serious loss. But cabbage growers cannot afford to feed successive broods of the caterpillar, until they in turn feed foes that will increase and in time destroy them, but prefer to kill them at once. We have published the various remedies that have been proposed, but we have not seen any that strikes us as so feasible as that proposed by the "Toronto Globe." It is simply hot water, applied by means of an ordinary watering pot. Those who have not tried it, are not aware that plants will bear with impunity water so hot, that one would suppose that it would kill them at once. By starting with water boiling hot, or nearly so, it becomes somewhat cooled by the time the cabbages are reached, it is cooled still more in passing through the air in applying it, and the cabbage leaves are so thick that they do not become suddenly heated, so that by the time the water touches the plant, it is hot enough to kill the caterpillars, and not sufficiently so to hurt the plant. It is of course, like other applications, most effective on the young "worms." One great difficulty in fighting insects of any kind, is due to the fact that they are not taken in time, but left until they have taken full possession. Cultivators of cabbages, cauliflowers, and the like, should note this for trial next season.

A NEW CANKER-WORM GUARD.—All the attempts to combat the destructive Canker-worm, depend upon the fact that the female perfect insect or moth is wingless, and after she comes out of the earth can only ascend the tree to lay eggs for her mischievous brood by climbing up the trunk. Surrounding the trunk with some obstacle that the insect can not pass would seem to be a simple matter, but there have been numerous inventions to accomplish it, many of which will answer if properly attended to, but none will be perfect safeguards if left to themselves. Most of the inventions provide some adhesive material, like tar or printer's ink, or some liquid like oil, over which the insect can not pass. These, if not looked to, will become bridged over by dust, or by the dead insects, and as soon as a passage way is found the mischief is done. Mr. John Bryan, of Conn., has invented a guard to which none of the above objections will apply. It consists of a stout band of vulcanized rubber, about an inch wide; along the center of this are closely stuck ordinary pins, in a close row, and project about an inch. When this strip is tacked around a tree it presents a collar of pin points outward. According to the inventor, it is impossible for the female moth to crawl over this. The pins are inserted by machinery and the affair is not expensive. This new invention is called the "Elm City Tree Protector."

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Home Topics.

BY FAITH ROCHESTER.

Pass It Along.

To hoard up treasures, or to waste them uselessly —both are sins against society. Everything should be put to some use. Yet, let us not forget that there is use in beauty, nor demand that things which minister only to the finer tastes, shall needlessly be made to serve the grosser appetites. I say "needlessly," for I think no thoughtful member of the great human family, will love to lavish much upon his or her "finer tastes," when surrounded by neighbors who are suffering for the most common necessaries of life. There is neither beauty nor utility in packing away, merely for preservation, articles that could give pleasure or comfort to human beings, though no longer serviceable to ourselves, simply because they are ours. It shows ill-judged economy, or pure selfishness.

I think we might all afford more generosity in our daily lives. We might trust ourselves—or rather we might trust the great Giver—and share more freely with those who have need, without worrying about our own to-morrow and its supplies. What would happen, do you suppose, if all the members of all the churches should suddenly come a great deal nearer than ever before to obeying that most trying test put to the young man of great possessions, who desired to be a follower of Jesus?—"Sell all that thou hast and give to the poor; then come and follow me." A good deal of common sense would have to go along with the attempt to obey such a command.

But only think of all the chests and closets full of out-grown or old-fashioned, but strong and warm garments, to be found in many houses at whose doors the wolf never howls, and where winter's frosts cause no alarm. Then think of the suffering poor, whom we "have always with us." A great deal of thoughtless wickedness is practiced in cutting up for carpet rags or for linings, garments which might do a great deal of service somewhere, in their present shape. I never thought of this until a friend took me to task, many years ago, for cutting up a good sack for some trivial purpose, because I did not care to wear it. "Only think of all the stitches in that sack!" she said. "When a garment has been cut out and made, it ought, if possible, to be worn out in that shape." I thought so too, when I came to look at the subject. For this reason, good garments should be made with simplicity, so that they may never look "old-fashioned," in an offensive sense.

In some families it is customary to pass baby-clothes from one to another, as different mammas have need of them, and this practice tends to the increase of sisterly love and sympathy. The world

will gain by it, as such affection and helpfulness overflow their family limits, until the stranger and the poor feel their effects. A common sorrow, or a common danger, draws human beings together, irrespective of the old barriers of family, sect, or nation. In times of war, or pestilence, people begin to feel their dependence upon each other. There are so many charitable "Homes" and "Children's Aid Societies," calling for help, that no one ought to feel justified in hoarding unused old clothes, which have warmth and comfort in them. "Charity begins at home," but it will not live and thrive, even there, if always kept at home.

It is not at all fair for those who can afford to purchase reading, to keep it all to themselves, while poorer people about them are hungering for something to read. Self love itself, should lead us to do all in our power toward educating our neighbors, so that we and our children have good and intelligent society. How childish are those men of wealth who shut their fine galleries of paintings entirely from the public, imagining that they somehow get more pleasure from such exclusive possession of coveted treasures, than they could if the treasures were open for the enjoyment of others.

Allowance for Growth in Children's Clothes.

These little boys and girls shoot up so fast, that garments made just right at the beginning of the season, seem to have shrunken in their proportions before the season closes. To avoid this, some mothers dress their children in garments made so long and loose that they are worn to tatters before their wearers have grown to fit the clothes. One extreme is as bad as the other, or perhaps a little worse; for if garments ever fit, it might as well be when they are fresh and new. I saw a little girl six years old, wearing the same woolen dress that was made for her when three years old. It had been made with the skirt turned up almost double,

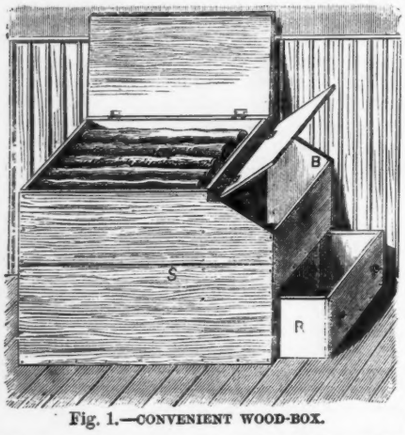


Fig. 1.—CONVENIENT WOOD-BOX.

and with large seams, capable of "letting out." Afterwards the skirt and sleeves were pieced down under a row of trimming. It struck me as a little too bad, to oblige the child of three to carry about her the cloth needed to clothe her two or three years afterward. There were younger children, and it would have been quite as good economy to have passed the out-grown garments of the elder one, along down the ranks, to be worn by the one they best fitted. A little dress, of good material and well made, will do service for three or four young children, a season each. It is always best to make allowance for a child's growth in measuring its new clothes, but care must be used not to burden it with unnecessary weight. Skirts of flannel or felt should not have deep tucks, as they are not only increased in weight, as a consequence, but are thus made more bungling, and fit to the figure less warmly. Skirts that have become too long for their growing owners, can be pieced down with some kind of trimming. Often a plain strip of some darker shade of the same color, improves the appearance, while it enlarges the garment. A cuff of the same on each sleeve, and a strip for a belt, if needed to lengthen the waist, may all be added without much trouble, and this is better than letting out burdensome tucks in heavy material.

Danger from Sugar.

In several journals I have lately seen warnings against the indiscriminate use of sugar. In the November number of the *American Agriculturist*, I find it in "Bee Notes" as follows: "In selecting sugar, avoid that having a bluish tint, as we have proof that it contains poison that will injure the bees. The same advice might be offered in regard to buying for family use."—I heard one of my neighbors complain of her white coffee sugar, which could not be used to sweeten cake or coffee, and had a bluish-green tint.

We are told that the old-fashioned methods of refining sugar by means of bullocks' blood, and other harmless materials, have been superseded by the use of poisonous chemicals, and that these are not all removed, but remain partially in the sugar as poisons. The purest and best sugars are the hard and white, or the coarse granulated. The brown sugars, which many consider sweeter than white sugar, are actually less sweet. They seem sweeter, because they dissolve more readily in the mouth when tasted.

I don't see any necessity for using much sugar or molasses, but most people differ with me. It is indeed an important element of food, but nearly every article that we eat contains a certain percentage of sugar, in a healthy form, and if the cooking is done so as to preserve the natural proportion of saccharine matter, the needs of the body are amply satisfied. I have seen children, (and their need of sugar is supposed to be greater than the need of adults),live for weeks or months without a single lump of sugar, or bit of candy, or piece of cake, or sip of molasses or honey; and they never seemed to miss the sweets, or to suffer in the least from lack of them. Not seeing anything of the kind, they never thought of them. After a fast of this kind, (with plenty of wholesome food, and fruit, and milk), the effect of sugar, or candy, or cake, is plainly perceptible. The breath is immediately affected, and the appetite capricious. The child professses to be hungry, but says "No, I don't want bread; I want something sweet.

Some suppose that this proves a natural appetite for concentrated sweets, but by the same reasoning you can prove a "natural appetite" for alcoholic drinks. Since it is not convenient for us to dispense entirely with the use of sugar, it is very desirable that we should have it in the most wholesome condition, and all enlightened people should refuse to purchase the most doubtful kinds, and use only the hard white or coarse granulated sugars. Few of us can examine for ourselves into the purity of sugars that we purchase, though a good magnifying glass may enable us to detect the adulterations of common fine white sugar with corn-starch, flour, or terra alba, and other impurities.

Economy of Water in Washing.

Doubtless most of my readers have heard of the method of washing without boiling white clothes, by spreading the clothes fresh from the suds in which they were washed, to bleach for an hour or so in the hot sunshine, then rinsing them in two clear waters, or "sudsing" and rinsing them. This method saves both fuel and water in summer time, provided you have green grass on which to spread your clothes. Now I think of it, I dare say some of my talk about the difficulties of cleansing household gear, may have seemed strange or exaggerated to some housekeepers in well regulated establishments. I do not wish to complain, but I will confess that in my various unprofitable movings about in eleven years, I have had grass about the house only twice, one summer each time. At other times the clay or sand, or fine black mold in the yard and around the doors, has served another purpose than to make washing and cleaning an easy task. Combined with this lack of grass for children to play on, and upon which their soiled garments might be bleached, and with the presence of unlimited quantities of black "dirt," has been the frequent difficulty of obtaining soft water in sufficient quantity for easy washing. So I suppose I may have spoken feelingly about the difficulties of washing-day.

But here comes another applicant for service, professing to save labor in the laundry—no less a person than Jack Frost. His service is certainly plenty and cheap in Minnesota. I am assured that one rinsing or simply "sudsing," is just as effectual as two rinsings after boiling, if you hang out your clothes and let them freeze dry. I am told that the clothes look as well, and smell as fresh and sweet as under the old plan, but I have not tried the method, it being now only November. If I get very tired of melting snow for the processes of washing, during the coming winter, perhaps I shall try the new plan advised by my neighbors, but not with entire faith that the result will be satisfactory. Still the advice comes from good housekeepers, who state that they have tried it themselves.

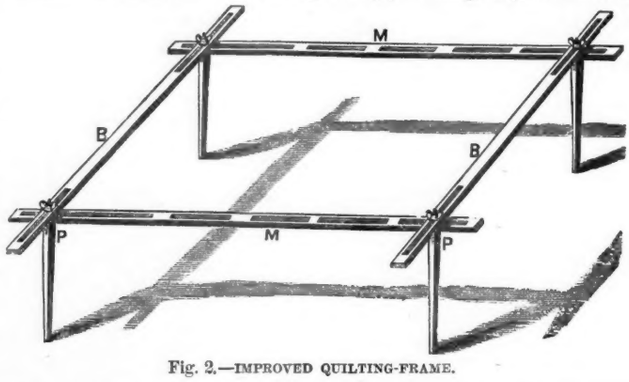


Fig. 2.—IMPROVED QUILTING-FRAME.

Hulled Corn.

This is a genuine country luxury. Though not very easy of preparation, a large quantity can be made at one time, to be eaten cold or warmed over in some way. If you wish only a six-quart panful of corn when hulled, take half that quantity of shelled corn. The same amount of ashes, or three quarts, is sufficient to make the lye, if hard wood-ashes are used. To the ashes add six quarts of water, heat and boil several minutes, skimming as impurities rise. A little cold water poured in, settles the lye when set off from the fire. Turn the lye off from the ashes, and strain it into a kettle with the corn. Boil it briskly half-an-hour, stirring

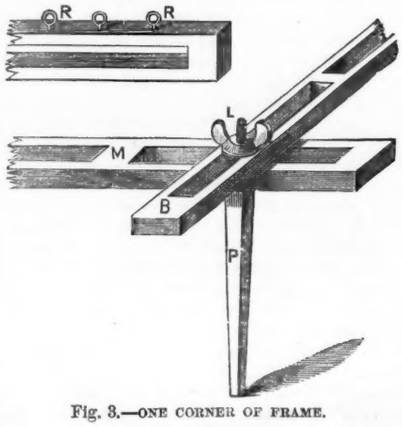


Fig. 3.—ONE CORNER OF FRAME.

it frequently. By this time the skins of the kernels should be loose and slip off easily. Strain off the lye, or skim out the corn, and rinse the kernels well with several waters. Then wash the corn covered with water in a large pan, rubbing it well with your hands until the black chits come off. Then rinse until the water looks clear. Put it back into the clean kettle, with clean water enough to cover

it, and boil it slowly until quite soft, adding hot water when necessary, and stirring frequently. When quite soft salt it—a large table-spoonful for six quarts of soft corn. To be eaten with milk or cream, or sweetened cream, or sugar, or butter.

Some Household Conveniences.

BY L. D. SNOOK, YATES CO., N. Y.,

Wherever wood is burned, something to hold it is necessary, as a matter of neatness as well as to protect the floor and wall where the wood is placed. In former volumes we have given designs for rustic and other wood-boxes, suitable for a sitting-room, and here give one from our ingenious correspondent, Mr. Snook, which, though intended for the kitchen, with a little care in finishing, may be made to serve for other rooms. This box, which is shown in figure 1, should be of stuff not less than ¾-inch thich, and all the better if of inch boards. The large compartment, for holding wood, is 22 inches high, 14 in. wide, and 22 in. long, inside measurement. The side portion, *B*, with sloping lid, is 10 inches deep, the same wide, and of course as long as the other portion. Below this is the drawer, *R*, shown partly open. For the kitchen the box may be painted, to conform to the general woodwork, but for other rooms a pleasing finish may be given by papering the exterior with wall-paper. Very clever imitations of oak, walnut, and other woods, are now made in wall-paper, some of which would be appropriate for such a use as this. Of course the large division is for wood, and it should be recollected that the durability of the box will depend much upon the care taken by the person who keeps it supplied. If the wood is dumped by the armful into the box with a crash, it will last but a short time. There is a right and a wrong way in so simple an operation as dropping an armful of wood. The drawer may be used for kindlings, and the compartment above as a receptacle for dust-pan and brush, stove-blacking, etc.; or these may go below and the kindlings above.

An Improved Quilting Frame.

On rare occasions a quilting frame is in demand in a family, but when not in use it is very much in the way, especially if people are so short-sighted as to build a country house without a garret. The old style of quilting frame, in which the sides and ends are tied together, or insecurely held by pins, and the whole set upon the backs of four chairs, is still in use. It is a bungling affair, with nothing but cheapness to recommend it. The frame proposed by Mr. Snook, and represented in figures 2 and 3, is a great improvement over the common one, especially as it can "stand alone," it being provided with legs of its own. Figure 2 shows the frame as set up; the side pieces, *M*, *M*, are 20 ft. long, 2½ in. wide, and 1 inch thick; several slots, an inch wide, and 20 in. long, are cut in these, as seen in the engraving. The end pieces, *B*, *B*, are about 8 feet long, the other dimensions being the same as for the sides. The legs, *P*, *P*, are 2 ft. 4 or 6 in. long, of square 2-inch stuff, and are worked down to one inch square at the bottom. In the top of each leg is firmly driven or screwed a half-inch iron bolt, which projects three inches, and upon the upper half of which is a thread, upon which a winged nut, *L*, easily turns. Figure 3 gives one corner of the frame, and shows the manner in which the parts are held together by the screw and winged nut; the slots in the side and end pieces allow the frame to be quickly adjusted to a small or large quilt. Strips of list, or thick woolen cloth, are tacked upon the inner edges of the frame, to which the edges of the quilt are attached by basting, or, if preferred, small screw-eyes may be inserted every five inches, to which the edge of the quilt may be fastened by a few stitches.

BOYS & GIRLS' COLUMNS.

Indoor Games of Marbles.

BY L. D. SNOOK, YATES CO., N. Y.

[Girls do not often play at out-door games of marbles, but here are some games at which girls as well as boys may play. These are given by our friend Mr. Snook, who invents so many useful things for older people, but does not forget the young folks.—ED.]

A MARBLE-BOARD WITH MALLET STRIKER.—This board (fig. 1) is made of pine or other light wood, an inch and a half thick, thirty inches long, and about fifteen inches wide, with strips one-quarter inch thick, nailed around the edge, to project an inch and a half above the surface of the board. Near the center of the board is placed one end of the guard-strip, *B*, which is one-quarter of an inch thick, one inch wide, and six inches long, nailed or glued at the angle shown in the engraving. With a compass strike six circles, each six inches in diameter, marking them with a pencil, or paint, and number from 10 to 100, in the manner shown at figure 1. The game is to place the marble or small ball at *A*, and with a little mallet strike it a light blow, so that it will take a course similar to the dotted lines. Each player is allowed five shots, or the use of five marbles. A marble stopping within a circle, is counted the number of the circle, but if it rests upon the line, or outside of a circle, the stroke is lost, and no number counted. It will require considerable skill to strike the marble just hard enough to stop within the circle numbered 80 or 100, which all will play for. A game requiring more skill on the part of the players to gain the highest number, is shown in the

Fig. 1.—GAME OF MARBLES WITH MALLET.

PORTABLE MARBLE-BOARD WITH SWINGING STRIKER.—In this, (fig. 2) the dimensions of the board are as in figure 1. Within five inches of one end there is placed an arch of wood or wire, one foot in hight, and should be so arranged as to be readily removed, or fold down upon the board when not in use. A leaden ball half-inch in diameter, is suspended by a string from the top of the arch; the lower part of the ball should just miss the board when swinging. Circles and a triangle are drawn upon the board and numbered as in figure 2. A common-sized marble is placed one inch toward the center from the ball. The game is played by taking the swinging ball in one hand, and holding it out over the end of the board, and, when the proper position is thought to be reached, to let it swing inward; it will be quite likely to strike the marble, and that will come at rest perhaps near the opposite end of the board. Five strokes are allowed each player; a stroke is the *first* swinging movement of the ball after leaving the hand, and two strokes in succession missing the marble, is called *one* stroke, and is to be so counted, also should the marble be moved just to or a little beyond the dotted lines, *E*, it is counted as a stroke. The point is to so strike the marble that it will stop within one of the circles or triangles, of course the player having the greatest number of counts wins the game. A game much simpler, yet requiring skill to win repeatedly, we call the

Fig. 2.—GAME WITH SWINGING STRIKER.

SET MARBLE GAME, in which all the marbles are placed in position before a stroke is made. The board is of the same size as in the other games, only the strip is left off at one end. Three inches from the end, and at equal distances apart, are placed four marbles; two inches from this row, and equally distant from one another, is placed another row, containing five marbles; five inches from the open end is placed a row containing four marbles. After measuring off the distances here given, a small indentation is made at each point, which is easily done by striking a marble or bullet with a hammer at the point desired, and should be just deep enough to keep the marble from rolling about. With the mallet each player strikes in succession the four marbles near the open end of the board, which, when rolling, should displace as many as possible at the opposite end; after the four marbles have been knocked to the opposite end of the board, the vacant numbered places are counted up, if all are vacant, a count of 190 will be made, but there will usually be less, unless the players are skillful. After one has taken his four shots, the marbles are set for the next. These games may be played by two or several persons; each playing in turn, which may be decided by drawing lots, or by agreement among themselves.

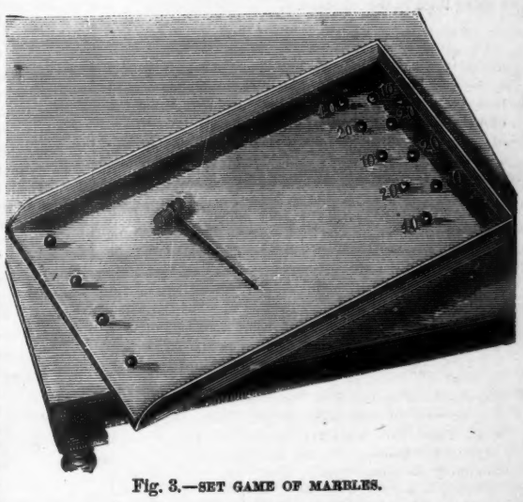


Fig. 3.—SET GAME OF MARBLES.

The Doctor's Correspondence.

As usual, I have a budget of letters asking questions, and as usual, I fear that I shall disappoint some of my young friends, who will eagerly look for answers, and not find them. A bright boy or girl will in a few minutes ask more questions than the wisest man can answer in a long while. Indeed, a great many of the questions that come to me are unanswerable. Every year people are

finding out more and more about the world we live in, but the most learned is soon brought to a point where he must say "I do not know." ...Master F. J. P., Ionia Co., Mich., profits by what he reads, for having an insect to send, he made a very clever case by boring a block of wood as I directed some time ago. But my young friend should not use tacks to fasten in the plug. I wonder that the post-office people did not see them and charge me letter postage. Such things when sent by mail must be tied only, and in such a manner that they can be opened readily. The case contained

THE POTATO OR TOMATO WORM

in the pupa state; this was found in a manure heap, but they are generally in the ground. Most of you, I think, know the fat green "worm" or caterpillar, that makes such work with the tomato and potato vines; it is as large as a small boy's finger, and has a horn at its tail, which some people think is a sting; it neither stings nor bites, and is harmless to everything but the plants—but how it does eat them! When this caterpillar has made its growth, it goes into the ground, throws off its skin, and appears something like a curious little brown jug with a handle. Next season the fellow wakes up, bursts its brown shell, and comes out a large quick-flying moth, which you sometimes see at dusk about the flowers, where it hovers, and runs its long tongue into them in search of honey. The part which makes the handle to the jug-like pupa, is the case that holds the long tongue. The scientific name of the insect is *Sphinx quinquemaculata*, the Five-spotted Sphinx.....Another boy, in Iowa, wishes some simple way to make

BLACK OR VIOLET INK.

Violet ink I know nothing about making, and less about using. I think it should never be used; indeed, people as a matter of safety should let these fancy inks alone. Good black ink we know will last for centuries, and if it fades can be restored again. Unless you use a great deal of ink, it will be cheaper to buy it, than to be at the trouble of making it, but as it is well enough to know how, I will tell you one of the ways. The best ink is made of galls and copperas, (Sulphate of Iron), water, and a little gum is used to keep the ink from spreading; these are all that any ink need contain. There are different ways of putting these together; as you ask for the simplest, I give it. Into an ordinary quart bottle put a pint of rain-water and two ounces of broken galls, not powdered, but broken up as fine as wheat grains; you can break them by putting them into a piece of strong cloth, and pounding them with a mallet. Let the galls and water stand in a warm place for a week or more, shaking every day, or as often as convenient. Then add half-an-ounce of gum arabic, and three-fourths of an ounce of copperas, and shake occasionally for three or four days or more. The ink will then be ready for use, and may be poured off from the dregs, or left on them, as you choose, but if left, you must take care in pouring off the ink when wanted, not to stir up the dregs. This ink will be pale when first written with, but will grow jet black in time. Should it not flow readily from the pen, add a little sugar, not more than a quarter of an ounce to the pint. A few bruised cloves will help to prevent mold, but nothing except keeping it stopped, will prevent this, or any other ink, from drying up and becoming thick in the inkstand.

PUMPKIN-SEED MATS.

A question comes to me, which should go to Aunt Sue, but as there is not time to send it to her and get a reply, and as the seeds are likely to be more plenty this month, than later, I take the liberty of answering it myself, though out of my line. THE DOCTOR]. Yes, Alice B., I have "heard of pumpkin-seed mats," and what is more, of "melon-seed bags." When I was a youngster the girls and young women carried a *reticule*, and the old women carried a *bag;* they were both the same thing, but it was thought more genteel to say reticule. These bags were of various sizes, shapes, and materials, and answered the place of pockets. No doubt your fathers and mothers can recollect what a wonderful thing their grandmother's bag was, and the many nice things that came out of it. The bags of the older persons were strong and large; those of the young girls were small, and of some fancy material, often of beads of various colors, worked into pretty figures. At one time melon-seed bags were in fashion; these were made of the seeds of the musk-melon, and black, cut-glass beads of various sizes; these were strung on strong silk, to make an open-work net, and this was lined with silk. These bags were very pretty, and no one would guess at the material without first examining it closely. But about the pumpkin-seed mat. The seeds—those of squash will answer quite as well—are to be dried, then all the poor and small ones picked out, so as to have them alike in size; if the thin film or skin of the seeds has not fallen off in drying, it should be rubbed off, to leave a clear white surface. You will need some very strong linen thread and a needle. Begin by stringing 18 seeds, passing the needle and thread through their small ends, and tie the thread securely; this will give you a rosette of seeds, standing on their edges. Now between each two of these seeds put two other seeds, the thread passing through the large ends of the seeds of the first row, and through the small ends of those in the second row. The diagram will show how this is done. For the third row, put three seeds in the spaces between the pairs of the second row, and so continue, using four seeds for the next, and so on, until the mat is large

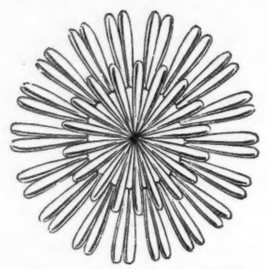


Fig. 1.—PUMPKIN-SEED MAT.

enough. If intended for a toilet table, the mat may be finished with a fringe at the edge, and a bow in the center, of any desired color. If to be used for a tea-pot, then it is better if left plain, except a bow in the middle. If strong thread is used, and the knots at each row carefully made, the mat will be much more serviceable than one would suppose.

Aunt Sue's Puzzle-Box.

GEOGRAPHICAL ENIGMA.

I am composed of 26 letters:
My 1, 11, 19, 5, is a city in Italy.
My 3, 19, 9, 12, 2, 23, 24, is a city in Persia.
My 18, 26, 19, 10, 22, 3, 8, 21, 7, is a city in Tennessee.
My 4, 20, 18, 24, is a city in Massachusetts.
My 22, 25, 16, 17, 14, 26, is a city in Austria.
My 24, 23, 15, 8, 7, 19, is a city in Italy.
My 6, 12, 17, 22, 13, 21, 8, 16, is a city in Kentucky.
My whole is a city, and where situated. E. W.

METAGRAM.

Entire, I'm often seen on people's faces,
Adding no charm to any of their graces;
Beheaded, by a certain class I'm worn,
More to protect or hide than to adorn.
Behead again and you will see a bird
(Its song is not the sweetest ever heard!)
Restore my heads; curtail (one letter shorter),
You then will see what floats upon the water.
Behead me now and quickly you will find
An animal, most useful to mankind.
Curtail me once again, and you will see
Something that might be "short for" you and me.
D. M. W.

PUZZLE.

Take one quarter of a pear, half of a quince, half of a pear, half of a plum, and another quarter of a pear, and make a delicious fruit. SALLIE.

CROSS WORD.

My first is in take but not in bring,
My next is in knight but not in king,
My third is in eat but not in drink,
My fourth is in judge but not in think,
My fifth is in snow but not in hail,
My sixth is in picket but not in rail,
My seventh is in hut but not in shed,
My eighth is in cot but not in bed,
My ninth is in dark but not in light,
My tenth is in strength but not in might,
My eleventh is in cent but not in dime,
My twelfth is in mortar but not in lime,
My thirteenth is in ale but not in tea,
My fourteenth is in lake but not in sea,
My whole, in these pages, you oftentimes find,
'Tis improving and pleasant and just to my mind.
SYDNORA.

BLANK DECAPITATIONS.

(Fill the first blank in each sentence with the word which is to be beheaded for the second blank.)

1. A —— him and asked what —— him.
2. In the night I heard the dog —— and the —— hoot.
3. The latter took —— as soon as it was ——.
4. Please —— —— carefully.
5. I scarcely dared to —— the —— paper.
6. Its —— was —— feet.

DIAMOND PUZZLE.

1. A consonant. 2. Large. 3. The end. 4. A division of animals. 5. To tax. 6. To beg. 7. A consonant.
ORION.

SQUARE WORD.

1. A tree. 2. A gas. 3. Northern. 4. A vowel, and light blows. 5. A Russian river. ORION.

ANSWERS TO PUZZLES IN THE NOVEMBER NUMBER.

NUMERICAL ENIGMA.—Saint Peter's.

CROSS WORD.—Mabel.

PI.—A millstone and the human heart
Are driven ever round,
If they have nothing else to grind,
They must themselves be ground.

SYNCOPATIONS.—1. Feather, father. 2. Cart, cat. 8. Coral, coal. 4. Heart, hart. 5. Trowel, towel.

DIAMOND PUZZLE.	SQUARE REMAINDERS.
G	B—EAR
R A G	F—ARE
R U L E R	F—RED
G A L I L E O	HIDDEN TRANSPOSED FRUITS.
G E L I D	1. Pear. 2. Grape. 3. Quince.
R E D	4. Berry. 5. Peach.
O	CHARADE.—Partridge.

PUZZLE.—DID. (D stands for 500, consequently two Ds equal one thousand. Divide the two Ds by one, or I, and you have DID.)

A CITY.—New York.

CONCEALED SQUARE WORD.	TRANSPOSITIONS.
C O N C H	1. Part, trap.
O M A H A	2. Scar, cars.
N A I A D	3. Tame, meat.
C H A S E	4. Arm, mar.
H A D E S	5. Rap, par.

Thanks for puzzles, letters, etc., to P. T. V., George, J. C. C., John Smith, Bella, Sid, Kitty, C. F. Y., Patsie, C. J. D., Geo. W. W., and Erastus.

Send communications intended for Aunt Sue, to Box 111, *P. O., Brooklyn, N. Y.*, and *not* to 245 Broadway.

Aunt Sue's Chats.

ADELE.—A butterfly is a rather pretty "shape for a pen-wiper." Cut two pieces of black cloth the shape of figure 1, but about twice as large. Button-hole one piece around the edge with yellow silk or worsted. (This keeps it in good shape.) Work yellow dots all round the edge, and the six dots in the center of the lower wings

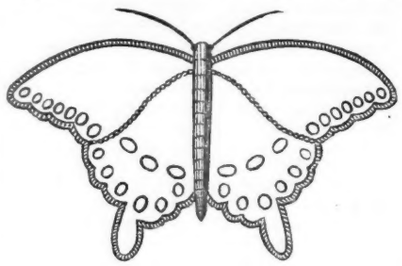


Fig. 1.—BUTTERFLY PEN-WIPER.

blue. Cut half a dozen pieces of black silk (or muslin) a little smaller than the pattern, to put between the pieces of cloth. Chain-stitch the lines between the upper and lower wings with red. Roll up a small piece of black velvet (black cloth will do), and fasten it on to the worked piece by red worsted, sewed over and over. Before sewing the body into place, put all the pieces together where they belong, and fasten them all in place by sewing on the body. Sew two black beads on the head, for eyes, and draw a piece of waxed black silk through the head for the long feelers or antennæ.

Fig. 2.—PART OF SHADE.

ALICE G. S.—Your letter reached me too late to give you any hints for your Christmas-tree. By "many scraps of wool," do you mean pieces of colored worsted? A good way to use up the latter is to knit reins for little boys to "play horsie"; these are always acceptable, and

a few toy sleigh-bells sewed on where the different colors join, make them very attractive. I hardly know what to suggest for "the pictures of fruit-cans," unless they would do for lamp-shades, one in each section, like figure 2. Or for shaving-cases, figure 3. Cut two pieces of card-board any shape you choose; paste a strip of gilt (or other ornamental) paper around the edge, stick your picture on the center, cut a number of thin papers a

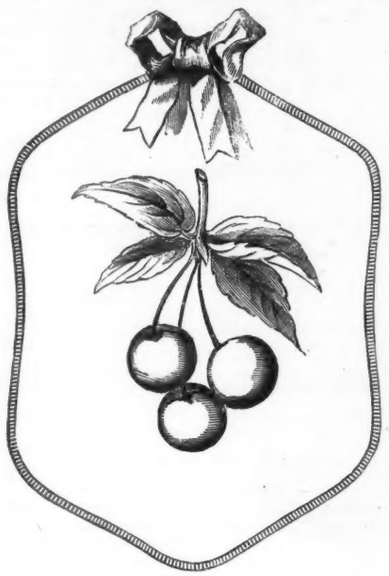


Fig. 3.—A SHAVING-PAPER CASE.

little smaller than the case, and fasten all together with a fine string. Ornament with a bow of ribbon, and hang it up by "Papa's" shaving-stand.

ANNIE BURNS.—Directions for making a toilet-set, including most of the articles you mention, have been already given in the *American Agriculturist*. If you will turn to the number for June last, you will find them.

W. PARSONS.—Much obliged, but we want only original contributions.

HARRY B. CRAMER sends two puzzles for the *American Agriculturist*, one of them is—"Be above making mischief in a family between man and wife," and the other is—"J. Underhill, Andover, Mass." The lad says he is twelve years old, and made these puzzles himself. Now, as I happen to know that these puzzles are over twenty years old, Mr. H. B. C. must be older than he thinks he is, if he *made them himself*.

GUSSIE.—I presume the "word which rhymes each time you behead it," is "Laboratory"; *e. g.*, laboratory, aboratory, boratory, oratory; ratory, atory; tory, ory; ry, y. If any of you know of any other word which will do the same, we should be glad to hear from them.

How Things are Done in Other Countries.—Flour from the Grain.

Last month we described the old and slow ways of thrashing, by trampling out the grain by means of horses and other animals, and compared this with our quick way of doing the same work by machinery. We also told you that in some countries the people do not improve at all in their ways of doing work, but carry on their farming exactly as it is described in the Old Testament, in the earliest times of which we have any record. Thrashing is the first step towards making the grain into bread, and after describing this we had not room, last month, to say anything about the next step—grinding the grain—which we propose to do now. As you may suppose, grain that has been trampled out on an earthen thrashing floor will be very far from clean; it is mixed not only with the chaff, but also much fine earth from the thrashing place, and these must be separated before the grain is ground. In our thrashing machines a blast of wind blows away all such stuff, and the grain comes out very clean. Then almost every farmer has a "fanning-mill," with which, if the grain is not clean enough, as it comes from the thrashing machine, he can finish it. It is also used for grain, beans, etc., that are thrashed with a flail. In the fanning-mill, the grain falls upon sieves of different sizes, where it is shaken, while all the while a large fan-wheel blows a strong and steady stream of air over it, and the grain comes out bright and clean; the chaff and dust are blown away, the sieves remove all the small and poor wheat grains, and also the seeds of weeds that are often mixed with it. The work is done very neatly and quickly, and the wheat and other grain leaves the mill all ready to be ground.

But the ancient farmers had no fanning-mills, indeed they were not known anywhere until about 100 years ago, and it was very slow work for them to clean their grain, as it is to those people who have learned no new ways since the flood. Last month we told you that the Mexicans where quite as much behind the rest of the world in all such matters, as are the people of Eastern countries; we do not mean all Mexicans, but those who live away in the parts where there are but few people, and the few who do live there are much more like Indians than like Europeans, and if you were to live among them, as we have, you would get a glimpse of the ways in which the farmers managed before the Christian era. When the Mexican has trodden out his—or her—wheat, (for the women quite as often do it as the men), by the use of horses, oxen, or even goats, then it is gathered in a heap, and a windy day is waited for. When there is a good breeze blowing, the wheat is thrown, by means of a rude wooden scoop-shovel, against the wind; the heavy grains soon fall, while the light chaff and dust, are blown to a distance. It looks very droll to see them throw up the wheat as if for the fun of the thing, but they manage it very cleverly, so that the clean wheat will fall in a pile, and not be scattered, as you would suppose, far and wide. This operation is called winnowing, and it was by this that grain was cleaned in very old times. The grain being cleaned, the next operation before we can get a loaf of bread, is to grind it, to make flour, coarse or fine. In the grinding, a mill is used, but before we notice the ancient mill of the old world, let us look at a very ancient one of the new world. In most of their farming the Mexicans use the implements now common in Eastern countries, and which are just like those of very early times, but in their mills, or grinding affairs, they borrow from another class of ancients. In various parts of Mexico, there are ruins of very old buildings and towns; these are generally mere heaps of rubbish, but some have the walls still standing; when these were built, or who built them, is not known; the Indians of the present day know as little about them as we do. In these ruins, among pieces of broken pots of various kinds, are found the grinding stones formerly used by the people who built these now ruined houses. The stones are shaped like that shown in fig. 1; a slanting bench of very hard stone, with a sort of pestle or grinder. A stone of this kind is called a *metate*, (pronounced in three syllables), and is a very important article in Mexican housekeeping. Those found in the ruins, though much worn, show much better work than those made at present. The way in which the metate is used is this: the woman kneels at the higher end, and putting a handful of grain on the stone, takes the rubbing stone by both hands, and bearing hard upon it, crushes and grinds the grain into a coarse flour. It is slow work, and as the Mexicans are not a provident people, but live "from hand to mouth," there is seldom any flour on hand, but if breakfast, or other meal is to be prepared, the woman starts with the grain, and has to make the flour before any bread or cakes can be baked. So far as we know, the use of the metate is not known in the old world, but it is very old in the new. The earliest mill of which we have any account, consists of the two circular stones; the lower one is fixed, while the upper one is movable, and has a hole in the middle through which the grain is dropped, and an upright stick placed in it near the edge, serves as the handle by which it is turned around. The engraving, fig. 2, shows this mill, and the manner of using it. The "two women grinding at a mill," mentioned in the Scriptures, may still be seen in the Eastern countries, as they were in old, old times; indeed among

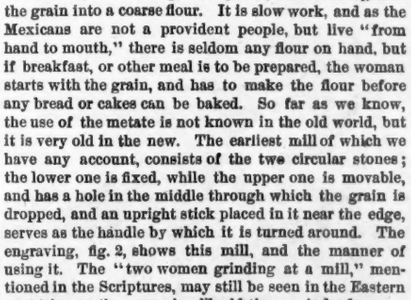


Fig. 1.—A MEXICAN METATE.

the country people in some parts of Ireland, almost precisely such a mill may be seen in use. Grinding grain by such a mill is very slow work. In Mexico we have seen just such a mill, only several times larger, and instead of an upright stick by which the upper stone could be turned by hand, has a projecting one, to which a donkey was hitched. A donkey, especially a Mexican one, is not at best a fast animal, and when hitched to such a mill, he appears to try how slow he can be, and yet move.

We do not know that our patience was ever so much tried, as in getting a few bushels of wheat ground with this most primitive mill. These grinding affairs, the metate, and the simple mills, leave the bran mixed with the flour. This is in part separated, in Mexico at least, by shaking the whole, as it comes from the mill, in a sort of sieve, made by fastening a piece of skin to a hoop; this does not sift, but shaking brings the bran to the top, and it is blown off by the breath; sometimes, but rarely, regular sieves are used. If you would see how much better and quicker we do all these things, you should ask permission to visit the nearest flouring mill, where water or steam-power take the place of the woman at the metate or mill, and where the stones fly round with a buzz, and the ground wheat, when it comes from between the stones, passes into a big revolving sieve that separates the fine flour, the middlings, and the bran. Indeed, so ingenious are our mechanics in helping our farmers, that we have mills which are as complete in themselves, as the large flouring mills in the great wheat-growing states, and with which, set in motion by his horses, the farmer can turn

Fig. 2.—ANCIENT AND EASTERN MILL.

out the finest flour. If you will look back at last month's *American Agriculturist*, you will see on page 456, figure 1, a mill of this kind, intended for farm use. We do not believe in boasting, but we do believe in appreciating the good things we have, and in feeling grateful for them. A large share of our boys and girls live upon farms, and it is only right that they should know how much better a farm-life is in this country, than it is in some others. Let them compare the rude metate, and the almost as rude hand-mill here described, with the very complete and compact mill in last month's paper, and when they know that in everything that relates to farm life, and home comforts, the farmer in this country is as much better off, than those in the historic lands of the East, or in our neighboring country Mexico, they should be thankful that their lot has placed them where life is easier, and that one of the most necessary articles—bread, is not earned by quite so much "sweat of the brow,"

The Doctor's Talks — A Look at Lapland and the Lapps.

Some of you will wonder why the Doctor begins the New Year of his "Talks," with a subject so unlike those he usually chooses. One reason is—I like—and so do all of you I think—variety, and as in answering several of my correspondents I have had to talk about "bugs and beasts," I thought you would like to know about the Lapps, about which we hear so little—even less than we do about the Icelanders. Then again, I usually talk on some subject that I know something about, and it will be a change to take one about which I know almost nothing, besides in this case I shall learn something, as well as yourselves.—"Yes, and take it all out of a book," some bright youngster will say.—Not so fast my boy, I shall give you new and original matter, though it will not be mine, and this brings me to the principal reason why my "Talk" is this time about Lapland. A very good friend of yours—that is he is a good friend of the *American Agriculturist*, and of course must be of its family of youngsters, Mr. Krohn, who lives in Norway, has been off among the Lapps, and he sends us a number of excellent photographs, and a very full account of the country and the people. I have had engravings made

from two of the photographs, and his account, which was not intended to be printed and is very long, I shall use to make a "Talk," for you.—Well now, in the first place, look for Lapland on your maps. You, of course, find it in Europe, but not, at least it is not in any of my maps, put down as a regular division, but Lap-land or the land of the Lapps, extends across the northernmost parts of Norway, Sweden, and Russia, and borders on the Arctic sea. It is said that the Lapps once had what is now Norway and Sweden, but that they have been gradually pushed north by more powerful nations, until they now have only a narrow territory, with the Arctic Ocean on one side and high mountains with perpetual snow on the other. There are only about 30,000 of them altogether, and these are scattered in tribes, which have but little to do with each other, and according to Mr. K., they speak such different languages that those from one part of the country can not understand those from another part, though they all call themselves one nation. Though professedly Christians, they are very superstitious, and believe in witches and spirits, good and evil. As a rule they are very small, the men being rarely over five and often under four feet high, and the women much smaller; they have dark skins, very black and straight hair, very little beard, which they pull out when young, and dark, deeply set eyes. They dress in woolen cloth in summer, and in furs in winter, and are fond of gay colors. They use when traveling on the snow a kind of skates, called "skiders," which are made of light wood, one of them as long as the person who wears it, and the other a foot shorter; the feet are fastened to the middle of these by thongs, and with them he can skim over the snow so fast that he can overtake the swiftest animal. Perhaps if asked what you know about the Laplanders, almost every one of you would answer—"Reindeer"—and you would be right, for this is the most peculiar thing about them, and they are the only people in the world who regularly use any kind of a deer as a domestic animal. I don't intend to give you a full history of the Lapps, or to tell you all that Mr. K. writes about them, but only about the points shown in the pictures, the people, their houses, and their reindeer. As to the people, the upper picture shows their dress, and with what I have already said about them, you will have a good idea of how they look. The men show much skill in carving articles from reindeer's horns, and the women in weaving ribbons and other finery of bright colors to wear. Some of the Lapps are wandering tribes, living always in tents and moving from place to place; others build huts of stones and moss (as in figure 1), which they live in in winter, and take to their tents only in summer, when they go from the mountains down to the sea, while others still, called the Fisher Lapps, live near the water all the year in the most miserable huts, surrounded by heaps of decaying fish; these are regarded as the lowest of all and they are so dirty as to be very unpleasant people. The tents are made like those of some of our Western Indians; a lot of poles placed together to form a cone, and this is covered in summer with coarse cloth, and in winter with skins; a hearth or fire-place of stones is made in the middle of the tent, and the smoke goes out at a hole in the top. The floor is covered with skins, and in this place, not more than six feet across, the whole family sleep at night, and huddle around the fire by day. All their furniture consists of a chest for the best clothes, a few bowls, pots, and kettles. Living in this way, it is no wonder that they are not clean, that the smoke causes most of them to have sore eyes, and that there are a great many blind people among them. Even the wealthiest live in a manner that the poorest among us would think most miserable. Their wealth consists almost entirely of reindeer. Though the most useful, the reindeer is probably the least graceful of all the deer family; you can see by those in the lower picture, which are photographic portraits, that it is far from being as handsome as our American deer. It is remarkable for the great size of its spreading hoofs, which allow it to travel over the snow. The horns are very large, and broad at the top, and weigh from 20 to 25 lbs. Unlike other deer, the females, as well as the males, have horns. It feeds in winter entirely upon what is called reindeer moss, which is a whitish kind of *lichen*, not rare in our Northern States, and very abundant in Lapland. The deer gives its owner no trouble about feeding or stabling; it digs its own food from under the snow, and all the housing it gets is a pen at night to keep off wolves; in summer it feeds upon the leaves of trees and upon green herbs. Sometimes the deer are wild, but they can be made very tame and become fond of their master. The females furnish a very rich milk, though but little of it, and is used as food and to make butter and cheese. The deer is used for riding and to draw the sledge, and as a pack animal; but it is not much used for riding, as it is very weak in the back-bone, and the saddle is placed on the haunches. The Lapps, who wander from place to place, rarely stay in one spot more than a fortnight; by that time the pasture is used up, and in half an hour the tent is taken down, and that, with all the household goods, is packed on the backs of the deer, and the family start to find a new home. The picture shows one of the deer with its pack, ready to start. But it is in the sledge or "pulka," as they call it, that the deer travels best; this is like a boat with a round bottom, and it carries but one, and he is packed in with furs very snugly. The deer has a collar around its neck, from which the traces run down between its legs, and are made fast to the sledge; reins are attached to the horns, and small bells are fastened to the collar, as the deer is fond of their sound. The deer will draw the sledge 60 or 70 miles a day. Perhaps you think it would be a grand thing to go off in this style, but it is really hard work, and not without danger. The driver has all he can attend to; he has to balance the sledge with his body—for woe to him if he should upset! He carries a stick to steer by, and to prevent an overturn; there are no roads, and trees are many; if the sledge should strike a stump or a stone while at full speed, the rider would suffer. After all I think that I prefer our sleigh with a horse. Some rich Lapps have as many as 1,000 to 1,500 reindeer, and 300 are considered enough to support a large family; the rich owner can kill his deer, and buy with the sale of the skins all that he wants. The meat of the deer is the chief food of the Lapps, and they put every part of the body to some use: the tongue and marrow are choice parts; the blood is made into a pudding; the skin is made into clothing and serves for tents and bedding; the horns and bones are worked into spoons, knife-handles, and other small articles, and even the hoofs are used to make jelly and glue. Though so useful, the reindeer sometimes gets furious; then the owner must look out, and if he is on a journey he hides under the overturned sledge until the animal gets over its "tantrums." There are some unpleasant things about the Lapps, but they have two good qualities—hospitality and a great love of peace. Mr. Krohn states that the stranger is welcomed to the poorest Laplander's hut; the common salutation being "Is peace in the land?" and is given the warmest place and the softest skins; he adds: "peace is his motto, his first question is for peace, and his good bye is, 'may peace be with you.'" "Who would be a Laplander?" you will say. Yet they like their life, and wish for no other; if taken from home, they pine and are miserable until they can get back.

Fig. 1.—A FAMILY OF LAPPS AND THEIR HUT.

Fig. 2.—REINDEER, ONE PACKED FOR A JOURNEY.

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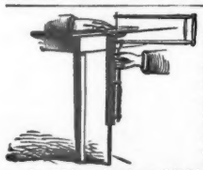

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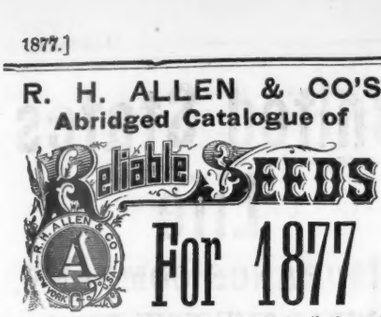

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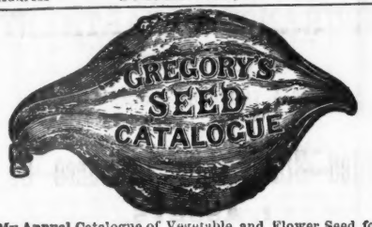

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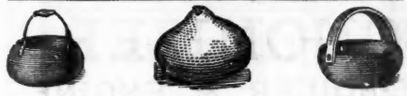

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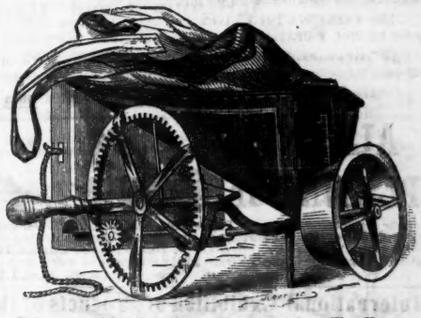

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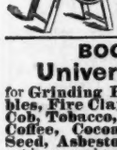
The "A. B. C." Victor Corn Sheller and Cob Separator.
The "Prize" Churn. Over 30,000 in use.
The "A. B. C." Animal Poke.—Highest award at Centennial.
The Level Tread Horse Power. do.
Ice Tools of every description.

A. B. COHU, Manuf., 197 Water St., N. Y.

THE NEW YORK PLOW CO. WORKS,
Newark, N. J.—55 Beekman St., N. Y.,

Manufacture latest Improved Implements. Send for Illustrated Circulars. A new Line of Hard Metal (Adamant) Plows, adjustable Beams.

GALE'S VEGETABLE CUTTERS



will cut by hand one to two bushels, and by power ten bushels per minute. Price, $10 to $40. Not to paid for until trial and found satisfactory. Circulars free.

Also the best **Self-feeding Hay, Straw, and Corn Stalk Cutters.**

Address WALKER GALE'S ESTATE, Chicopee Falls, Mass.

BOGARDUS'S PATENT
Universal Eccentric Mills
for **Grinding Bones, Pot Shells, Ores, Old Crucibles, Fire Clay, Guanos, Oil Cake, Feed, Corn** and **Cob, Tobacco, Snuff, Sugar, Salts, Roots, Spices, Coffee, Cocoanut, Tomatoes, Saw-dust, Flax Seed, Asbestos, Mica, Horn,** etc., and whatever can not be ground by other Mills. Also for **Paints, Printers' Inks, Paste, Blacking,** etc.

JOHN W. THOMSON, Successor to JAMES BOGARDUS, Cor. White and Elm Sts., New York.

MEYERS & ALLEY, Wholesale Dealers & Commission Merchants in POTATOES, either for **Consumption** or **Seed.**
83 MURRAY ST., NEW YORK.

NO. 1 PERUVIAN GUANO.—POTASH.

BARON JUSTUS VON LIEBIG says of Peruvian Guano: "*It is the most powerful fertilizer known; it has been tested, and found to succeed in all climates, on all soils, and for all crops.*"

PROF. GEO. VILLE, OF FRANCE, WRITES: "To convert Peruvian Guano *into a* COMPLETE MANURE, it is sufficient to add to it potash and lime (Plaster). Guanos are not always of the same composition. Their richness in Nitrogen varies from 5 to 14 per cent, and their contents in phosphates extend it to 35 per cent; (at the present time even to 50 per cent). *Such was the state of ignorance that continued to prevail till within a few years, that the fertilizing properties of guano were exclusively attributed to the Nitrogen (Ammonia) it contained.*"

Prof. VILLE'S "Complete Fertilizer," and ALL FORMULAS FOR SPECIAL CROPS MAY BE OBTAINED from me in the form of GENUINE PURE PERUVIAN GUANO, POTASH SALTS, and GROUND DRIED BLOOD and FLESH—the latter articles supplying any additional proportion of POTASH and AMMONIA required.

The price of these formulas, as sold by me, is based upon the amount of the three following ingredients contained in the same:—Ammonia, (17½ cents per lb.), Phosphoric Acid, (soluble and reduced, 9 cents per lb.), Potash (5¼ cents per lb.)

These prices are **EVEN LOWER** than those current in France, as quoted by Prof. Ville. The Plaster will be omitted from the formulas when desired, and deduction in price made for the same at the rate of Eight Dollars per ton.

All of these articles are shipped in **SEPARATE PACKAGES—UNDER GUARANTEED ANALYSES**—accompanied with directions for mixing and use.

The **CONCENTRATION** (in weight) of these formulas, as furnished by me, is also greater than of the same as used by Prof. Ville.

☞ GRANGES, DEALERS, and others, making their own fertilizers, will find it to their interest to send for estimates of cost, for comparison.—Send for circulars containing composition of crops, formulas, etc.

CHARLES V. MAPES, 158 Front St., New York.

ALLEN'S PLANET Jr. **SILVER MEDAL**

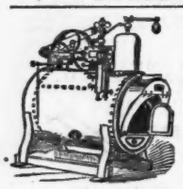
Hand Seed Drills and Wheel Hoes, have also been awarded the **Centennial Medal** and **Diploma,** and the *Medal* of the *Great Horticultural Exposition, held at Erfurt, Germany,* besides a large number of *First* Premiums at State and County Fairs. Full Descriptive Catalogue of our whole line of goods *free.* Including our *Wrought Frame Horse Hoe, "Iron Age" Cultivator, Paris Green Duster, Hand Garden Plow, Transplanting Hoes, Corn Knives, etc. Every Farmer* should have a copy, and we want a **live agent** at work, or a club formed in **every town.** Send for **new** terms.

S. L. ALLEN & CO., 119 S. 4th St., Philadelphia, Pa.

International Exhibition of Products of the Dairy at Hamburg in February, 1877.

Programms of this Exhibition may be had gratis of the Secretary of the undersigned Committee.

Dr. Richard Seelemann, No. 25 A. B. C. Strasse, Hamburg. *The Executive Committee.*

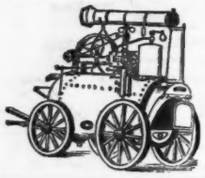


THE ECONOMIZER.

RETURN FLUE-BOILER & ENGINE.

Boiler all wrought-iron—Fire entirely surrounded with water—thereby dispensing with fire-brick, which always causes trouble by getting out of place, &c.

All sediment and lime settles in coolest place in boiler under fire-place, and can be removed through hand holes at bottom provided for that purpose.



THE ECONOMIZER AGRICULTURAL ENGINE.

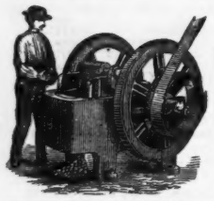
The cheapest by far and best Agricultural Engine, and the only return Flue-Boiler mounted on wheels. No danger from sparks while threshing. Perfectly safe in every respect, and guaranteed to give entire satisfaction.

Prices on all sizes very low, and terms liberal.

SEND FOR SPECIAL CIRCULARS.

WHITMAN & BURRELL, Little Falls, N. Y.

BLAKE'S PATENT STONE AND ORE BREAKER.



New Patterns, with Important Improvements and Abundant Strength.

For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

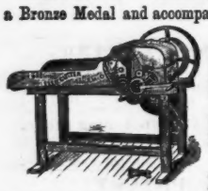
IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, etc.**

BLAKE CRUSHER CO., NEW HAVEN, CONN.

The United States Centennial Commission AWARDED THE "Silver & Deming Feed Cutter,"

a Bronze Medal and accompanied it with a special report.



REPORT.

For a Safety Fly Wheel arrangement. The wheel being fixed to the shaft by a friction cone.

In the event of iron or other hard substance getting into the feed, the Fly Wheel revolves but knife stops.

Also for a single plan of changing the cut by shifting cluster of gear wheels.

A. T. GOSHORN, Director General.
J. R. HAWLEY, President.
(Attest.) J. L. CAMPBELL, Secretary.

Manufactured only by

SILVER & DEMING MANUFACTURING CO.,

Send for Circular. **SALEM, OHIO.**

Granger's Almanac, 1877, 72 pages, history of the Grange, what it has done. Farmers ought to have it. 10 cts. a copy. S. HOWARD WILSON, Mechanicsville, Bucks Co., Pa.

Crude Petroleum, shipped by U. S. or American Express, Buffalo or Erie R. R. Send Postal for prices, also for fine poultry and American Watches. H. W. RUGG, Olean, N. Y.

CHAPMAN & VAN WYCK,

(Established 1849),

DEALERS IN

PERUVIAN GUANO

EXCLUSIVELY,

170 Front Street, New York.

HARRISON'S MILLS

Grand Medal at Centennial.

Standard Flouring Mill.

Cleaner Grinder and Bolter.
Ordinary size, 9 feet by 4 feet
Capacity 5 bushels per hour.
Finest flour, largest yields.
Cooled by a strong air blast.
Runs at one-tenth the cost
Of the old style mills.
Compact, practical,
Substantial, and very durable.

Standard Grinding Mill.

For all substances wet or dry.
Built of burr stone and iron.
For heavy or light power.
10,000 in operation.
Grind 75 bushels per hour.
Thickest French burr stones.
Double discharge spouts.
Adjustable babbitt boxes.
Solid self-adjusting burrs.

These Mills excel all others, even compared with those of double the size, double the weight, and double the price.

EDWARD HARRISON, Patentee and Sole Manufacturer,
135 Howard Avenue, NEW HAVEN, CONN.

United States Life

INSURANCE COMPANY.

WHAT THE NEW YORK INSURANCE DEPARTMENT REPORTS

AFTER A THOROUGH EXAMINATION

OF THE

United States Life Insurance Co.

I. ASSETS.

Real Estate		$61,002 94
Bonds and Mortgages, first liens		2,660,707 19
STOCKS AND BONDS OWNED.	*Par Value.*	*Market Value.*
U. S. Registered Bonds	$137,350	$139 208 69
N. Y. City Registered Bonds	508,000	540,675 00
Brooklyn Registered Bonds	213,000	226,780 00
Kings County Coupon Bonds	55,000	59,850 00
Buffalo City Coupon Bonds	140,000	149,045 83
Erie County Coupon Bonds	25,000	25,583 33
Eastchester, N. Y., Coupon Bonds	16 000	16,280 00
Richmond Co., N. Y., Bonds	2,500	2,562 50
Chicago City Bonds	50,000	50,500 00
South Norwalk, Ct., Water Loan	100,000	104,000 00
Jersey City Registered Bonds	74,000	77,140 00
Dist. of Columbia 3-65 Bonds	150,000	105,000 00
Totals	$1,470,850	1,515,625 35 — 1,515,625 35

COLLATERAL LOANS.

	Par Value.	*Market Value.*	*Amount Loaned.*	
Bonds and Mortgages	$50,000	$50,000	$30,000	
U. S. Bonds	10.000	11,600	10,000	
Dime Savings Bank Stock	3,000	3,000	1,500	
U. S. Bonds	1,000	1,130	900	
Rochester City Bonds	50,000	50,000	10,000	
Totals	114,000	115,730	52,400	52,400 00
Cash in Office		$473 02		
Cash in Bank, Per Certificates		103,989 24		
Total Cash Items				104,462 26
Premium Notes and Loans on Policies in Force				172,744 72
Net Uncollected and Deferred Premiums				115,490 00
Accrued Interest on Bonds and Mortgages				70,735 98
Accrued Interest on Premium Notes and Loans				6,234 58
Total admitted Assets				$4,759,403 02

Items not admitted as Available Assets.

Agents' Balances	$18,839 09
Bills Receivable	8,695 18
Total	27,534 27
Aggregate Total Assets	$4,786,937 29

II. LIABILITIES.

Net present value of all the outstanding policies in force on the 31st day of October, 1876, computed by the Insurance Department, according to the American Experience Table of Mortality, with 4½ per cent Interest	$3,846,827 00
Unpaid losses, including all reported and supposed claims	122,930 00
Premiums paid in advance	6,829 22
Accrued Rent	2,500 00
Liability for reserve on lapsed policies, where said policies can be restored on application	11,009 00
Total Liabilities	$3,990,095 22

III. MISCELLANEOUS.

Surplus as regards policy holders on the basis of admitted assets	$769,307 80
Surplus as regards policy holders on the basis of total assets	796,842 07
Capital Stock	250,000 00
Capital Scrip	125,000 00

JOHN A. McCALL, JR.,
S. M. BALLARD,
Commissioners.

INSURANCE DEPARTMENT.

ALBANY, December 4th, 1876.

I, WILLIAM SMYTH, Acting Superintendent of the Insurance Department of the State of New York, do hereby certify that I have compared the annexed copy of Appointment and Report of Commissioners on examination of United States Life Insurance Company of New York with the original on file at this Department, and that the same is a correct transcript therefrom, and of the whole of said original. (Schedules excepted.)

In witness whereof, I have hereunto set my hand and affixed my official seal, at the City of Albany, this 4th day of December, 1876.

WM. SMYTH,
[L. S.] Acting Superintendent.

AMERICAN AGRICULTURIST.

ORANGE JUDD COMPANY, Publishers, 245 Broadway, N. Y.

ANNUAL SUBSCRIPTION **Terms** (always in advance): $1.60 each for less than four copies: Four to nine copies, $1.55 each: Ten to nineteen copies, $1.30 each: Twenty copies and upward, $1.10 each. These rates *include Postage*, in each case, which is pre-paid *by the Publishers*. Papers are addressed to each name.

☞ Either English or German Edition, at these prices.

GREAT REWARDS FOR A Little Work.

EVERYBODY WANTS ONE OR MORE OF THE MANY GOOD THINGS In our Premium List.

The Publishers of the *American Agriculturist* take pleasure in presenting their new general Premium List for 1877. The Premiums which they have offered in past years have engaged the attention of a very large number of persons of all ages and both sexes. Many thousands have secured Premiums, and very many of these, who at first had small hopes of success, have been themselves astonished at the ease with which they have raised large clubs and secured one or more of the valuable articles here offered.

[*Read the Table of Premiums in next column and the notes below it.*]

Explanatory Notes.

N. B.

Read and carefully Note the following Items: The next Table tells the *name* and *cash price* of each article, and, (in the last column but one), gives the number of names sent in at the regular price of $1.60 a year that will secure any premium article. (The last column gives the number of names at the lowest club price for 20 or more names, that is $1.10 each. Some persons quickly raise large clubs by taking all the names at $1.10 each, and themselves pay the difference, 50 cents each, and even thus get the premium articles very cheaply.) (*a*) All subscribers sent by one person count, though from several different Post-offices. But....(*b*) Tell us with each name or list of names sent, that it is for a premium....(*c*) *Send the names as fast as obtained*, that the subscribers may begin to receive the paper at once. You can have any time you wish up to next July, to complete your list....(*d*) Send the exact money with each list of names, so that there may be no confusion of money accounts....(*e*) Old and new subscribers all count in premium clubs, but a portion, at least, should be new names; it is partly to get these that we offer premiums to canvassers....(*f*) Specimen Numbers, etc., will be supplied free, as *needed* by canvassers, (when 3 cents per copy is furnished to pre-pay postage), but they should be used carefully and economically, and where they will *tell*....(*g*) Remit money in Checks on New York Banks or Bankers, payable to order of Orange Judd Company, or send Post-office Money Orders. If neither of these is obtainable, Register Money Letters, affixing stamps both for the postage and registry; put in the money and seal the letter in the presence of the Post-master, and take his receipt for it. Money sent in any of the above ways is at *our* risk; otherwise it is not.

Table of Premiums.

[In the following table is given the price of each article, and the number of subscribers required to get it *free*, at the regular rates of $1.60 a year, and also at the club rates of $1.10 a year, postage included, which is prepaid in all cases *by the Publishers*.]

TABLE of Premiums and Terms For Volume 36—(1877).

Open to all—No Competition.

No.	Names of Premium Articles.	Price of Premiums.	Number of Subscribers required at $1.60	or at 1.10
1	*Pat. Magic Bellhead Pencil (Ludden & Taylor)*	$ 1 50	4	....
2	*Ladies' Magic Charm Pencil (do. do.).*	$ 2 00	5	20
3	*Gents' Magic Charm Pencil (do. do.).*	$ 3 00	8	30
4	*Gold Pen, Telescopic Case (do. do.).*	$ 2 50	7	27
5	*Gold Pen and Pencil, Telescopic Case, Elegant (do. do.)*	$ 5 50	13	37
6	*Centennial Magic Pencil (do. do.)*	$ 3 00	8	30
7	*Patent Telescopic Gold Pen and Pencil (do. do.)*	$ 6 50	15	45
8	*Knives and Forks (Patterson Bros.)*	$14 75	22	73
9	*Knives and Forks (do. do.)*	$18 50	28	95
10	*Carver and Fork (do. do.)*	$ 3 75	9	32
11	*French Cook's Knife, Fork, and Steel*	$ 3 75	9	32
12	*Pocket Knife (Meriden Cutlery Co.).*	$ 1 50	4	....
13	*Pocket Knife (do. do.)*	$ 2 00	6	22
14	*Pocket Knife (do. do.)*	$ 2 75	7	27
15	*Ladies' Pocket Knife (do. do.)*	$ 2 00	6	22
16	*Multum in Parvo Knife (do. do.)*	$ 3 50	8	30
17	*Boy's Wagon (C. W. F. Dare)*	$ 5 00	12	37
18	*Patent 4-wheled Propeller Velocipede, (C. W. F. Dare.)*	$ 8 00	16	52
19	*Crandall's* **John Gilpin**	$ 1 00	3	....
20	*Crandall's Masquerade Blocks*	$ 1 00	3	....
21	*Crandall's* **Acrobats**	$ 1 00	3	....
22	*Crandall's Building Blocks*	$ 2 00	5	20
23	*Crandall's* **Menagerie**	$ 2 00	5	20
24	*Case of Scissors (U.S. Steel Shear Co.).*	$ 4 00	10	34
25	*Terrestrial Globe (Schedler's) (Steiger)*	$ 3 00	8	30
26	*Combination Ten-pin Alley (Horsman)*	$ 2 50	7	27
27	*Pair of Skates (Patterson Bros.)*	$ 3 50	8	30
28	*Doll's Cottage Chamber Set (Dare)*	$ 4 00	9	32
29	*Child's Self-operating Swing (do. do.).*	$ 4 00	9	32
30	*Improved Table Croquet (Horsman)*	$ 3 00	8	30
31	*Utility Adj. Table (Lambie & Sargent)*	$ 8 00	16	52
32	*Boudoir Clock (S. E. Jerome & Co.)*	$ 3 50	8	30
33	*Houchin's Improved Patent Pocket Cook Stove*	$ 1 50	4	....
34	*Self-adjusting Gold-plate Watch Key, (J. S. Birch.)*	$ 1 00	3	....
35	*Pocket Tool Holder (Miller's Falls Co.)*	$ 1 00	3	....
36	*Piano, Splendid 7-oct. (Steinway & Sons)*	$650 00	625	1630
37	*Tea Set (Lucius Hart Man'fact'g Co.).*	$60 00	66	225
38	*Ice Pitcher (do. do. do.)*	$16 00	24	80
39	*Castors (do. do. do.)*	$ 9 00	17	54
40	*Cake Basket (do. do. do.)*	$12 00	19	65
41	*Revolving Butter Cooler (do. do.)*	$ 8 00	16	52
42	*One Dozen Teaspoons (do. do.)*	$ 6 00	15	45
43	*One Dozen Tablespoons (do. do.)*	$12 00	19	65
44	*One Dozen Table Forks (do. do.)*	$12 00	19	65
45	*Child's Cup (do. do.)*	$ 2 75	7	27
46	*Child's Knife, Fork & Spoon (do. do.)*	$ 5 00	12	37
47	*W. S. Blunt's "Universal Force Pump"*	$12 00	19	65
48	*Moore's Floral Set (Moore Man'f'g Co)*	$ 1 00	3	....
49	*Cahoon's Broadcast Seed-sower*	$ 5 00	12	37
50	*Bracket Saw (Millers' Falls Man'f Co.)*	$ 1 25	4	....
51	*Payson's Indelible Ink—Pen, etc.*	75	3	....
52	*Excelsior Pocket Microscope (Bausch & Lomb Optical Co.)*	$ 2 75	7	27
53	*Abbott Pocket Microscope (L. G. Abbott)*	$ 1 50	4	....
54	*Silver Watch (American Watch Co.)*	$30 00	44	144
55	*Garden Seed & Flower Bulbs (select'n)*	$ 2 00	6	22
56	*Planet Jr. Combined Drill & Hoe (S. L. Allen & Co.)*	$15 00	22	75
57	*Breech-loading Pocket Rifle (Stevens)*	$16 00	24	80
58	*Sporting & Hunting Rifle (Remington)*	$32 00	48	156
59	*Double Barreled Breech-loading Gun (E. Remington & Sons)*	$50 00	66	225
60	*Creedmoor Long Range Rifle (E. Remington & Sons)*	$100 00	110	330
61	*Turn-table Apple Parer (Goodell Co.)*	$ 1 00	3	....
62	*Climax Apple Corer & Slicer (do.)*	$ 1 00	3	....
63	*Family Cherry Stoner (do.)*	$ 1 00	3	....
64	*Bay State Apple Paring and Slicing Machine (Goodell Co.)*	$ 1 50	4	....
65	*Sewing Machine (Remington)*	$70 00	80	298
66	*Reid's Patent Butter Worker*	$10 00	18	58
67	*Family Scales (Fairbanks & Co.)*	$14 00	21	70
68	*Washing Machine (Doty's)*	$14 00	21	70
69	*Clothes Wringer (Best—Universal)*	$ 8 00	16	52
70	*Worcester's Great Illust'd Dictionary*	$10 00	18	58
71	*Any back Volume Agriculturist*	$ 1 75	....	20
72	*Any Two Back Volumes do.*	$ 3 50	....	29
73	*Any Three do. do. do.*	$ 5 25	13	37
74	*Any Four do. do. do.*	$ 7 00	15	47
75	*Any Five do. do. do.*	$ 8 75	17	54
76	*Any Six do. do. do.*	$10 50	19	61
77	*Any Seven do. do. do.*	$12 25	21	68
78	*Any Eight do. do. do.*	$14 00	23	74
	(Each add'l Vol. at same rate.)			
79	*Twenty Vols. XVI to XXXV.*	$35 00	47	162
80	*Any Back Vol. Agriculturist*	$ 2 50	....	24
81	*Any Two Back Volumes do.*	$ 5 00	....	36
82	*Any Three do. do. do.*	$ 7 50	16	48
83	*Any Four do. do. do.*	$10 00	18	60
84	*Any Five do. do. do.*	$12 50	21	71
85	*Any Six do. do. do.*	$15 00	24	82
86	*Any Seven do. do. do.*	$17 50	27	92
87	*Any Eight do. do. do.*	$20 00	30	102
	(Each ad'l volume at same rate)			
88	*Twenty Vols. XVI to XXXV.*	$50 00	68	230
89	*A* **$10** *Library (Your Choice.)*	$10 00	18	58
90	*A* **$15** *Library do.*	$15 00	24	85
91	*A* **$20** *Library do.*	$20 00	31	106
92	*A* **$25** *Library do.*	$25 00	38	125
93	*A* **$30** *Library do.*	$30 00	44	144
94	*A* **$35** *Library do.*	$35 00	50	162
95	*A* **$40** *Library do.*	$40 00	56	177
96	*A* **$45** *Library do.*	$45 00	62	192
97	*A* **$50** *Library do.*	$50 00	68	207
98	*A* **$60** *Library do.*	$60 00	80	237
99	*A* **$75** *Library do.*	$75 00	100	282
100	*A* **$100** *Library do.*	100 00	125	360
101	*A Choice of Good Books. (See Description.)*			

Unbound. Post-paid. — *Bound. Post-p'd.* — *All sent paid through by Mail or Express.*

☞ *Every Premium article is* **new** *and of the very* **best** *manufacture. No charge is made for packing or boxing any article in our Premium List. The Premiums,* **Nos. 1 to 7, 12 to 16, 19 to 22, 24, 32 to 35, 50 to 53, 55, 71 to 101,** *inclusive, will each be delivered* **FREE** *of all charges, by mail or express (at the Post-office or express office nearest the recipient) to any place in the United States or Territories.—The other articles cost the recipient only the freight after leaving the manufactory of each, by any conveyance desired. An* **Illustrated Descriptive Premium List** *sent* **free** *to applicants.*

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from p. 9.

Are Jerseys or Short-horns the more Useful?—"C. E. B.," Springfield, Ill. These two breeds are both indispensable, and cannot be compared with each other as to usefulness. To reply to the above question is as impossible as to decide whether a horse or a cow is the more useful of the two. Their purposes are distinct; one gives rich milk, the other is a beef animal. Both butter and beef are necessary, and we can no more do without the one than the other. To dispute about such a question is a waste of time.

To Rid a Colt of Worms.—"J. T.," Greenfield, Conn. Give an injection of salt and water, about one ounce of salt to a quart of water; the next day give a quarter of a pint of linseed oil by the mouth.

Crude Petroleum as a Paint.—"E. O. N.," Tracy City, Tenn. We have frequently expressed a favorable opinion of petroleum as a paint for fences, sheds, and out-buildings, and after using it have no reason to change our view. Recently we used it as a priming coat, and found lead paint to cover it very well. It gives a sort of dull brown color to the wood to which it is applied, but for out-buildings or fences, this is not disagreeable. Colors do not mix well with it, as the oil penetrates the wood, and the color is left upon the surface, from which it soon falls or is rubbed off.

Spring Wheat in Ohio.—"W. F. S.," Union Co., Ohio. Spring wheat is not usually a profitable crop in Ohio. It requires a more northern climate. It would be a waste of time to try to grow it. Barley would be a much more profitable crop.

The Goodenough Horse-Shoe.—"W. E. P.," Port Gibson, Miss. The peculiarities, or rather the advantages, of the Goodenough shoe are, that it is made with several projecting points which give it a firm hold upon the ground, and prevent slipping and wearing of the heads of the nails, that it has no calks, and permits the frog to come to the ground, thus preventing those diseases of the foot which result from cutting away of the frog and raising it from the ground, so that it cannot be brought into its natural action. The shoes, of any sizes, are sold at about the prices of other shoes by the Goodenough Horse-shoe Co., New York.

Corn Planters.—"G.," Jefferson Co., N.Y. We have used Emery's corn planter for sowing fodder-corn in drills, and there are other planters suitable for this work. Corn may be sown with the common grain drill, by closing all the spouts, except the middle and end ones, making three rows in the width of the drill.

Comparative Value of Hay, Corn-Meal and Bran.—"H. G.," Allendale, N. Y. The estimated comparative values of hay, corn-meal, and bran, for feeding, are as follows: 1 ton of hay is equal to 500 lbs. of corn, or to 800 lbs. of bran; hay at $10 a ton is equal to corn at $40, and bran at $25 a ton. This is predicated from the quantity of nutriment contained in equal given quantities. But the whole of the corn is not digested and a loss is sustained in consequense of that; it would be safe to reduce the value of corn-meal at least one-fourth on that account, or to a proportionate value of $30 a ton. These approximate values are corroborated by many experiments in feeding.

Shepherds' Dogs.—In view of the large inquiry for shepherds' dogs, it would certainly be profitable for some competent person to make a business of breeding and training them, and then to inform the public of the fact by advertising it. There is a great need for trained dogs, and hundreds could be sold if those who want them could find them. A well trained sheep dog is worth $100 to any shepherd, but it would pay some one well to raise and train them for a quarter of that price.

Warts.—"Reader," Austin, Texas. Warts are tumors caused by a diseased enlargement of the vascular papillæ of the skin. The cause of this growth is not understood. The only remedy is excision, or removal of the diseased portion of the skin, by caustics. If the warts are small, or have a narrow stem, they may be removed by tying a silk or other strong thread around them so tightly as to arrest the circulation, when they will

soon drop off. Or they may be clipped off with a pair of shears, and the wound touched with a hot iron or lunar caustic, (nitrate of silver). If they are broad and flat, their removal may be effected by the use of nitric acid with which the surfaces may be touched daily, until they are eaten away, when the raw spot may be dried and healed by the application of a solution of sulphate of copper (blue vitriol). Where the warts are very large and numerous, and a cure would cost more than the animal is worth, it should be fed for the butcher. No warty animal should be used for breeding.

Horse Racing at Fairs.—"G. W. L.," Delaware Center, Iowa. Whether or not county fairs can be made successful, without horse trotting, must depend upon the condition of public sentiment. There are localities, (a very few), where a whiskey shop would be an unprofitable speculation; and in the same degree, we fear, a genuine agricultural fair would be very rarely successful. The idea has often occurred to us, that if farmers who object to the trotting would keep away from it, or from the fairs where it is the chief attraction, or protest against it, something might be done. But while people continue to go to see the racing, and pay for it, the amusement will surely be provided for them.

To Get Rid of Quack Grass and Thistles.—"H. F. G.," Allendale, N. Y. To destroy quack grass of any of the different species to which this term is applied, the ground should be plowed and harrowed thoroughly and the roots picked off the surface. A rake for this purpose was described in the *American Agriculturist* of Nov., 1865. Any left will grow again. Potatoes, corn, beans, or other hoed crops should be grown and kept cultivated and weeded thoroughly. There will be little quack left after three clean hoed crops have been taken. Thistles may be destroyed by plowing lightly, so as to cut the stem but not the roots, and then growing crops that are cultivated continually.

Salting Beef.—A correspondent in Haverhill, Mass., sends the following as his method of putting down beef. Select a barrel that is strongly hooped, and fit a board of sufficient thickness, so that the bottom of the barrel may rest on that, instead of the chine. Place it in the cellar, directly under a solid floor beam. Cover the bottom of the barrel with salt, then put in a layer of beef, the pieces being cut small enough to pack close, and pound them down with a club; then sprinkle them over with sugar and salt. Continue putting in layers of beef, pounding them down, and sprinkling on salt and sugar, until all is packed. Use six quarts of salt, and 3 or 4 lbs. of sugar to each 100 lbs. of beef. Place a strong follower in the barrel upon the beef, and set a piece of joist upon the follower, so that the end of the joist will come under the beam; drive a wedge between this and the beam above, pressing the beef quite hard; every twenty-four hours drive up the wedge, and the beef will soon be covered with brine. After a few days the pressure may be removed.

Pennsylvania Poultry.—"M. R.," New York. The chickens and capons from Bucks and the adjoining counties in Pennsylvania have the best reputation in the city markets. Capons are made to weigh 12 pounds, and sell at 35 to 40 cents a pound. The poultry is mostly of the Dorking, Dominique, and common breeds, but it is the management rather than the breed, that produces the high quality. The chickens are brought out early in the season, and are well fed from the first. The cocks are made into capons. About three weeks before marketing the birds are put up in coops, and fed upon soft food, consisting of corn and oat meal, potatoes, and some scraps of fat meat or chopped suet. This is given several times a day in small quantities. Many spring chickens are sent to market from these localities which bring the highest prices, generally at about 50c. per lb.

Holes in Trees.—"W. A.," Union Grove, Wis. The holes around the stocks of your trees are no doubt the work of some species of woodpecker. It will require an examination to determine whether these holes injured the trees, or if it is due to the work of the insects which the birds were after.

Another Potato Enemy—fortunately for us in Algiers, is now reported. The parent insect is a moth; its caterpillar lives in the potato—the tuber itself—and by the time it is through with it, the potato is not even fit for the pigs. The scientific name of the insect is *Bryotropha solanella*, and it is hoped that we shall only know it by name.

Answering by Numbers.—Sometimes a correspondent asks several questions, and puts a number opposite to each. Thinking it may save space in the paper, and save us the trouble of copying his questions, he adds, please answer by the numbers. This is a request with which we can not comply. If we print, "6. No. Six inches will be wide enough, if the material is strong," the one who proposes No. 6 will know what it means, but every one of the thousands of other readers will be completely in the dark. Those who ask us to "reply by numbers," will see how unfair it is to every other subscriber. We have often stated, and we find it necessary to repeat it, that if the question is a merely personal one, and its answer will be of no use to a considerable number of readers, it has no chance whatever of a reply in the paper. This is one of the reasons why we insist that every one who asks a question, should give name and address. We answer hundreds of letters by mail, because we do not care to occupy space with matter which, if not of general interest, will at least be useful to a considerable number. To make the matter intelligible, we always give the question, or the substance of it, before answering it.

What to Do with the Straw.—"A. M. Van A.," Fort Howard, Wis. When a farmer can dispose of a load of straw to a livery stable for 8 loads of manure in exchange, he wants no better way of using his straw. But few farmers are so favorably situated as this. There should be no trouble about using the straw, if one has roots to feed with it, and sufficient capital to buy a few head of cattle to winter over. Then half a dozen thin cattle, which are easily picked up for the cash anywhere, may be purchased, and put loose into box stalls, and each one fed with a bushel of roots and two or three pounds of meal daily, and all the straw they will eat. The straw should be cut in a fodder cutter, and the refuse used for bedding. The litter and manure may remain until spring beneath the cattle. The increase in value of the cattle should pay a profit, and there will be a valuable pile of manure to grow more roots with.

A Good Cow in South Carolina.—"W. W. R.," Pendleton Factory, S. C., writes that his cow, a grade Ayrshire, was awarded the first premium for the best milk cow at his county fair, where she gave 13¾ quarts of milk at one milking. The same cow also took the first premium for milk cows at the S. C. State Fair. He thinks this a very good result for a cotton State.

The Value of Pea-nuts as Feed.—"W. W. L.," Saluda, S. C. Pea-nuts are a very rich food, as they contain from 40 to 50 per cent of oil. When this oil has been expressed, the residue or cake has about 7 per cent of oil left in it. An analysis of this cake recently made by Dr. Vœlcker, gave as follows, as compared with linseed cake, viz.:

	Cake free from husk.	*Unhusked Cake.*	*Linseed Cake.*
Moisture	9.58	9.28	11.72
Oil	7.40	6.99	12.09
Starch, gum, and diges. fiber	27.63	23.67	25.29
Albuminous matters	42.81	32.81	32.64
Indigestible fiber	7.87	23.80	11.79
Ash	4.71	3.45	6.47
Total	100.00	100.00	100.00

The pea-nut cake contains about 7 per cent of nitrogen, and is therefore a very valuable feed for growing animals, as well as fattening beasts. We do not know of any having been used in this country, we believe that all that is made here is exported to England, which should not be.

Flat-Bottomed Boats.—"C. H. A. W.," Napa, Cal. A description, with illustrations, of a flat-bottomed boat, suitable for fishing or hunting, was given in the *American Agriculturist* for Nov., 1876. From this description any one who can use tools can build the boat, at the cost of five or six dollars for materials.

Egg-bound Fowls.—"R.," Garrettsville, Ohio. It is not at all uncommon for hens, especially old and infirm ones, to become egg-bound. The eggs without shells collect in the egg-passage, and form a mass of hard, cheesy matter, which in time causes the abdomen to swell, and finally kills the fowl. We know of no remedy, except to anticipate the end and decapitate.

"Prepared Foods" for Cattle, Poultry, etc.—We dislike secrecy in all things. Secret medicines we do not publish. We have in some cases allowed the advertisements of foods for cattle, poultry, swine, etc., to appear in our columns. In *every instance* the proprietors of the articles have been informed that we could publish upon only one condition—that they must show us the formula by which the compounds are prepared, that we may know their exact composition. Those who have good articles are perfectly willing to do this, and the appearance of an advertisement of any of them indicates that we know what it is made of, and did we wish such an article, would make use of it ourselves. We can say in general terms that these compounds consist of well known tonics and appetizers, and as they are made up ready for use, the owners of animals of various kinds have at hand a condiment, which is about as cheap, considering the trouble, as if they bought the ingredients, and made it themselves, and being at hand, they are likely to use it when needed. We have given considerable thought to this matter, and acting wholly in the interest of our readers, have taken the course above indicated. Of course, each one must judge for himself, if it is desirable to use such condiments, and if he decides to give them, he can do so with the assurance that he is giving nothing deleterious.

"Science Applied to Farming," Correspondence.

COMPOSTING COTTON-SEED.—"J. B.," Mississippi. The newspaper articles on composting cotton-seed, you refer to, are evidently abbreviated from Circulars 22 and 26 of the Georgia Department of Agriculture. I cannot testify to the utility of the processes recommended from actual experience, but from the chemical standpoint, the plan of mixing cotton-seed with manure, earth, and acid phosphates, is eminently rational, and ought to prove excellent. The directions below are taken from the circulars referred to. The farmers of Georgia, by the way, are remarkably fortunate in having so enterprising an Agricultural Department to look out for their interests.

FORMULAS FOR COMPOSTING COTTON-SEED.

If the stable manure and cotton-seed have been preserved under shelter, and the compost is for oak and hickory lands, use the following:

NO. 1.—FOR A TON OF 2,000 LBS.

Stable manure	750 pounds.
Cotton-seed (green)	750 "
Acid Phosphate or Dissolved Bone	500 "

Directions for Composting.—Spread under shelter a layer of stable manure 4 inches thick; on this sprinkle a portion of the phosphate; next spread a layer of cotton-seed 3 inches thick; *wet these thoroughly with water* and sprinkle with phosphate; next spread another layer of stable manure *three* inches thick. Continue to repeat these layers in the above order until the material is consumed. Cover the whole mass with stable manure or scrapings from the lot one or two inches thick. Allow the heap to stand in this condition until a thorough fermentation takes place, which will require from three to six weeks, according to circumstances, dependent upon moisture and the strength of the materials used. When the cotton-seeds are thoroughly killed, with a sharp hoe or mattock, cut down vertically through the layers; pulverize and shovel into a heap, where the fermentation will be renewed and the compost be still further improved. It is now ready for use.

For Cotton.—Apply in the opening furrow 200 pounds per acre, and with the seed at planting 75 or 100 pounds per acre, making in all 275 or 300 pounds per acre. If it is desired to apply a larger quantity per acre, open furrows the desired distance, and over them sow broadcast 400 pounds per acre; bed the land, and then apply 100 pounds per acre with the seed.

For Corn.—Apply in the hill, *by the side* of the seed, half-pint to the hill. An additional application around the hill before the first plowing, will largely increase the yield of grain.

For sandy pine lands, dissolve sixty pounds of muriate of potash in warm water, and sprinkle a proportionate quantity of the solution on each layer of stable manure and cotton-seed. The same weight of cotton-seed and manure, or 60 pounds of the two, may be omitted when the potash is used.

If lot manure, or that which has been so exposed as to lose some of its fertilizing properties, is composted, use:

NO. 2.—FOR A TON OF 2,000 LBS.

Lot manure	650 pounds.
Cotton-seed	650 "
Acid Phosphate	600 "
Sulphate of Ammonia	60 "
Muriate of Potash	40 "

Mix as in No 1, except that the sulphate of ammonia and muriate of potash must be dissolved in warm water, and a proportionate part of each sprinkled on each layer of manure and cotton-seed.

Directions for the use of these composts have been given only for corn and cotton—the two crops to which fertilizers are principally applied in Georgia. Experience, however, has shown them to be equally efficacious when applied to other crops, either field or garden. From 300 to 400 pounds to the acre on small grain have produced perfectly satisfactory results.

Varying proportions of Cotton-seed Manure.—In making these composts the proportions of stable manure and cotton-seed may be varied to suit the supply at command, though care must be taken, if the cotton-seed are largely in excess, to avoid excessive heat and consequent cooking of the seed. When killed, the seed should be soft enough to be readily mashed between the fingers. If only cotton-seed and acid phosphate are composted, the seed should be *rolled in the phosphate*, and shoveled into a heap to ferment. If composted in layers without stable manure, the seed will cake together.

Potash, where needed.—In the above formulas the potash may be omitted on lands, comparatively fresh, and on which the original growth was oak and hickory; but if such lands have been much worn, it will be well to retain

it. The presence of oak and hickory, or other potash consuming growth, is an indication of the presence of potash in the soil. When such lands, however, have been so worn that when turned out, stunted old field pines spring up, it is safe to assume that the addition of a moderate quantity of potash will increase production.

Concerning the use of potash on pine lands, the advice is given without statement of the grounds upon which it is based. It is presumed, however, that the statements would not be made without good reason. In lack of stable manure, the plan of composting the cotton-seed in layers with three or four times its bulk of earth would doubtless be excellent.

Acid Phosphates.—In Table 36 in the December *American Agriculturist*, were mentioned two superphosphates without nitrogen. These were imported from England, where they are manufactured cheaply, and of very high grades. A sample exhibited at the Centennial, and said to be made in this country, was guaranteed to contain about 31 per cent of soluble phosphoric acid. The price was $65 per ton, which would bring the soluble acid at about 10½ cts. per lb. The acid phosphates of our markets, however, are very seldom as rich as this, but more frequently contain 5 to 15 per cent of the soluble acid. Generally speaking, the highest grades are the cheapest, in the large markets were they are manufactured or imported. In places distant from the markets, the difference in favor of the high grades is still greater, on account of the cost of transportation. It costs no more to freight a ton of a 30 per cent, than a ton of a 10 per cent article. In the one case, the cost of freight is divided over 600 lbs., in the other, over only 200 lbs. of soluble phosphoric acid.

The greater part of these articles are manufactured from the fossil and mineral phosphates from South Carolina and Navassa, and contain more or less of useless material, as iron and alumina, which are valueless, increase the bulk and weight of the fertilizer, and, still further, cause some of the phosphoric acid, which has been rendered soluble by addition of sulphuric acid to change to the less soluble, and consequently less valuable form, known as "reverted," "reduced," or "precipitated" phosphoric acid. Still, since the supply of bones and bone-black is not sufficient to supply the demand for phosphoric acid, these materials must be used, and are used with profit.

How Bone-Dust is Made.—"J. W. S.," Union Co., Pa. Bone dust is made either as a refuse product in the manufacture of knife handles, buttons, and other articles, for which the shins and other hardest bones are used, or common bones are ground in a mill, such as the Bogardus Eccentric Mill, or others made for the work. The ground bones are sifted and separated into coarse, fine, or finest, or sold as they come from the mill.

Special Fertilizers.—"E. E.," Linden, N. J. Soluble fertilizers, such as guano or nitrate of soda, are useless, if not injurious, in a dry season. Without abundant moisture their solution is too concentrated, and destroys the tender extremities of the rootlets by which nutriment is absorbed. Too much water would carry the soluble matter down to the roots faster that it could be taken up, or if the plants are not in active growth, the fertilizing matter could not be appropriated. For these reasons we would use but very little of such soluble fertilizers in the fall, but apply the bulk of them in the spring, as soon as growth begins. Guano and nitrate of soda are generally used at the rate of about 250 lbs. of the former, and 150 lbs. of the latter, per acre.

Draining a Marsh by Pumping.—"Subscriber." There would be no difficulty in draining a marsh by raising an embankment around it, and pumping the water out of the ditches, if the land is worth the expense. The work would probably cost $40 or $50 per acre, and the pumping would be a continual expense. Before engaging in it, a competent engineer should be consulted, or the cost may be double what it ought to be.

Sprain of the Hip Joint.—"G. D.," Beans Corner, Me. The wasting of the muscles of the hip do not certainly indicate disease of the hip joint. The trouble may be in the hock. If it should be ascertained beyond doubt to be in the hip, the horse should have perfect rest for a few weeks. Cloths dipped in cold water should be laid over the hip, to reduce any heat of the parts, and when this is removed, the following may be rubbed on with the hand every second day, viz., turpentine one ounce, oil of cloves two ounces, creosote one ounce. Perseverance for a few weeks in this treatment may result in a cure. If not, a seton may be used, but only by a veterinary surgeon.

The Basis of Values of Fertilizers. "W. H. R.," Lexington, Va. The basis upon which the values of fertilizers are estimated, is derived, as near as may be, from the commercial values of those substances which supply the different ingredients most readily. Thus the value of nitrogen is based on the market price of nitrate of soda; ammonia is valued according to the price of guano, or that of sulphate of ammonia, a constant production of the gas works and a staple article in the market. Phosphoric acid is valued according to the price of bones or phosphates produced from them. In this way we get a settled basis of values. Ammonia is not now valued at 30 cents a pound; 25 cents or less, is a fair value, and phosphoric acid is valued at 12 cents for soluble, 8c. for reverted, and 6c. for insoluble. Of course the prices of these substances as fertilizers is regulated by their value for other uses, and *vice versa*.

Sowing Wheat on Clover Sod.—"I. R. C.," Holder, Ill., suggests the following manner of sowing fall wheat, viz., sow the seed on a clover sod, and plow it under, turning the sod to a depth of two inches only; then roll the ground.

Manhattan Blood Guano Co.—We are informed that Mr. Thos. J. Hand has retired from the Manhattan Blood Guano Co., and that Mr. E. F. Cooke is now the sole agent. The business is now conducted by Messrs. Wing & Evans.

Somebody Blundered.—The crews of the returned ships Alert and Discovery, of the British Arctic Expedition suffered terribly from scurvy. In this day of canned fruits and vegetables—about which, by the way, the English know but little—and when potatoes are so dried as to be difficult to tell on the table from fresh, these ships were sent to sea without proper stores. In our late civil war, the army was abundantly supplied with dried and canned vegetables of all kinds, but it takes people on the other side a long while to learn.

Paralysis in Hogs.—"W. M. S.," Aiken, S. C. It is difficult to decide what has caused the disease in your hogs, without knowing how they have been treated. If they have been kept in the woods, and have slept in cold, damp places, that would be quite sufficient to account for it. In this case the hogs should be well taken care of, fed with boiled potatoes, or boiled corn, given very slightly warm, and have good, warm pens and bedding. The weak parts should be rubbed with turpentine, and a piece of blanket should be tied around the body. But the cause may be parasites in the muscles or kidneys; if so, a cure is almost hopeless. Parasites may be prevented by keeping the hogs in pens, and not permitting them to eat offal or filth.

To get rid of Stumps.—"T. R. M." Probably the easiest way to remove stumps is by blasting. Dynamite is now used for this purpose with good effect. But an experienced hand is required to use the explosive, which is many times more powerful than common blasting powder.

Popular Scientific Works.—We some months ago referred to the excellent service rendered by Messrs. D. Appleton & Co., N. Y., to the advancement of science by the publication of works, which, though popular, are by the most eminent men at home and abroad. "Smatterers" in science have had their day, and it is now conceded that only thorough masters of a science are safe popular teachers.

Darwiniana.—Under this title are brought together in a neat volume of nearly 400 pages, the writings by Prof. Asa Gray, upon what is popularly known as Darwinism. Most of the chapters have appeared as articles in the various reviews and journals during the past 16 years. The general reader will probably get from this a much better idea of Darwin's views, than if he read Darwin's own works, and will also see how they are regarded by one abundantly able to test their accuracy as relates to at least one department of science. Price, $2.00.

The Races of Man, and their Geographical Distribution, by Oscar Peschel. This is a translation of one of the most recent and valuable works of the present time, and presents in a readable form the present state of our knowledge as to the history, and development, of our race, a subject now receiving much attention at the hands of scientists, and which has an interest for all intelligent readers. Pp. 528, Price $2.25.

Sound, by John Tyndall, D. C. L., etc.—Those who heard or read Prof. Tyndall's lectures, or are familiar with his former works on heat, etc., need not be told how admirably he presents his subjects, and the remarkable clearness in which he places matters usually regarded as abstruse. The present work is the third edition revised and enlarged. Prof. T. informs us in his preface that an earlier edition enjoyed the distinction of being translated into Chinese, and published by the Chinese government. Price, $2.00.

The Theory of Sound in Relation to Music, by Prof. Pietro Blaserna.—This is one of the International Scientific Series, and its author a resident of Rome, Italy. It covers a very different ground from Tyndall's work; that is a manual of acoustics, to illustrate principles, while this makes a practical application of the principles to music. This work commends itself to every musician who would understand the fundamental laws upon which his art is based. Pp. 187, Price $1.50.

Botanical Hand-Book, by C. E. Hobbs, especially designed as a reference book for druggists and apothecaries. This gives the various English names, the botanical and official names of all the crude vegetable drugs in common use. It shows much patient, painstaking work, and is a book which we can commend to our many pharmaceutical friends. Published by A. C. Hobbs, Sommerville, Mass. Price, $3.50.

Reports and Proceedings.—In order to start square with the new year, we acknowledge the following, received in the latter part of 1876. We hope our friends, to whom thanks for their attention, will not measure our appreciation of their kindness by the brevity of our notices.

The Massachusetts State Board of Agriculture.—The Report of the Secretary, Chas. L. Flint, Esq. for 1876, though not so profusely illustrated, as some previous ones, seems to contain an unusual number, (even for this Report), of useful and practical articles, some of which we have read with pleasure and profit.

The Wisconsin State Horticultural Society.—Transactions of the annual meeting, held Feb. 1876, compiled by F. W. Chase, Sec., has a handsome frontispiece in a colored print of Whiting's Siberian Crab, No. 20, one of the "iron-clads;" the reading matter covers a wide range, and what is sometimes overlooked, is *local* and consequently useful to the people of the State.

The Iowa State Horticultural Society's Report for 1875 and a part of 1876, contains useful papers and discussions, but there is some of the strangest matter, called "botany," that we ever saw in print. Has the Society no botanist among its members to correct these glaring inaccuracies?—If not, suppress the matter.

Forest Trees of the U. S.—This is a list with useful notes, of the remarkable exhibition of forest trees, in the U. S. Government Building, at the Centennial, which was made through the industry of Doctor Geo. Vasey of the Department of Agriculture. We hope that a building will be provided at Washington for this collection which should be preserved not only for its intrinsic value, but as a proper acknowledgment of the labors of Dr. V., and those who aided him.

Forests and Forestry at the Vienna Exhibition in 1873. Sometimes it does happen that our Government blunders into putting the right man in a place. This was done when Dr. John A. Warder was sent to represent us at Vienna, and why his experience and great knowledge were not made available and used in our own exhibition, is "one of those things no fellow can find out."—They didn't, and he didn't, and that's all any one knows about it. This Report on Austrian Forestry, and the Schools of Forestry, will in the future, when we think and act in this direction, be of even more value than it is at present.

Educational and School Books.—We have received from E. Steiger, 22 and 24 Frankfort st., N. Y., the publisher, who has done so much to introduce the kindergarten:

Friedrich Froebel, a Biographical Sketch, by Matilda H. Kriege, pp. 29. Price, in paper, 25c.; in cloth, 50c. This sketch of his life, with a portrait of the "Children's Friend," will be welcomed by the increasing number of those interested in his life-work, the kindergarten.

The Science and Art of Education, by Joseph Payne, of London, is a small work uniform in size and price with the above.

The following have been received from A. S. Barnes & Co., No. 111-113 William St., N. Y., a firm long known as one of the leading houses engaged in publication of school books. Their works are mechanically all that can be desired, and the names of the authors of eminence who contribute to their list of elementary works, indicate the high character of their publications. In the crowded state of our columns we can only notice them as bills in Congress are too often read—by title:

First Steps in General History. By Arthur Gilman, pp. 385. Price, $1 25.

Seven Historic Ages. Same author; pp. 144. Price, $1. The first of these is a compendium for the use of schools, and for reference; a very full bibliography adds to its value. The second is a familiar talk with children on the marked historic ages.

First Steps in English Literature. By the same; pp. 233. Price, $1.

Manual of Geometry. By W. G. Peck. Price, $1 60.

Pooler's Test Speller. Words with definitions, 25c.

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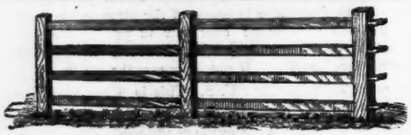

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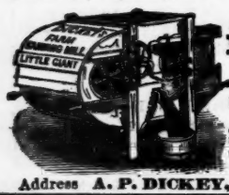

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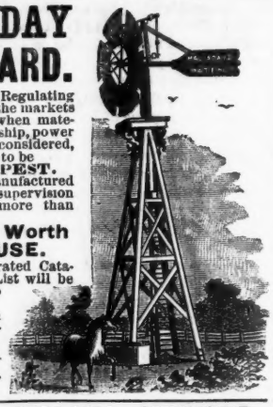

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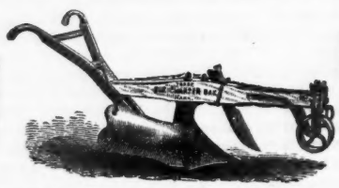

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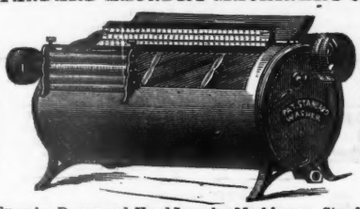

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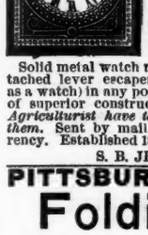

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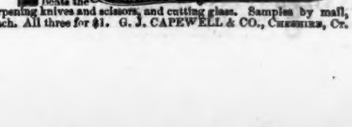

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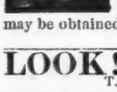

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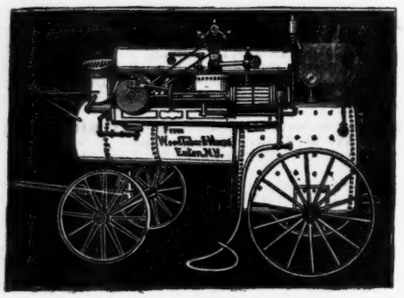

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